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THE MECHANISM OF PEPTIC ULCERATION

A REVIEW OF THE RESULTS OF EXPERIMENTAL INVESTIGATION*

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I wish to present some of the more important results obtained by my associates and myself from our investigations of the experimentally produced peptic ulcerations. I should have liked to include the development of the current ideas concerning the experimentally produced ulcer since the pioneer work of Bolton (1913), but because of lack of space I shall confine my discussion to the mechanisms of production of the lesion. Since this is a review of the results of investigation pursued over a period of many years, I shall draw freely on our previous publications for subject material. No attempt will be made to correlate the facts that have been learned about peptic ulceration from experimental studies with those that are known from clinical studies of the lesion in man, as knowledge concerning the life history of both the experimentally produced gastro-intestinal ulceration in animals and the spontaneously occurring lesions of man is as yet too incomplete.

Types of Peptic Ulceration produced Experimentally

In general the ulcerations of the gastric and intestinal mucosa which are considered as the so-called peptic lesions, and which we have produced and studied experimentally, can be classified into one of three groups on the basis of character of lesion, site of lesion, and mechanism of development. While the individual lesions in these groups have many characteristics in common, and while there are some experimentally produced ulcerations that do not correspond exactly to the major criteria for any group, on the whole the marks of delineation between the three groups of lesions are about as definite as obtains in most pathological conditions.

The first type of peptic ulceration I wish to describe is the one most often formed experimentally. It can be readily produced by a variety of methods. It appears to be similar in most respects to the lesion as seen at necropsy in man following death in uraemia and other conditions in which there existed a terminal toxic condition. This type of ulceration has usually only been seen as an acute lesion. There is as a rule more than one ulceration; the individual lesions are often but shallow erosions of the mucosa, irregular in outline and covering relatively large areas; and the mucosa of the fundus is more often involved than other regions of the stomach or the intestine. The exact site of occurrence of the lesions is never definite or constant; they usually begin as a haemorrhage in the submucosa, and the ulceration of the mucosa appears secondarily to the vascular injury. The lesions rarely extend deeper than the submucosa; very infrequently do they become chronic or perforate.

The second type of lesion produced experimentally more nearly resembles the chronic peptic ulcer as seen in man. The conditions under which it develops are definite and limited. It is usually single, although two or rarely three, hardly ever more, ulcers may be present at one time. The site of the lesion is in the pathway of the outflow of gastric content, never in the fundus. The exact site of its development is definite and constant. It starts on the surface of the mucosa as a greyish circumscribed membrane. At first it is saucer-shaped, and later the usual appearance of peptic ulcer as seen in man develops. In the beginning the lesion is acute, but if perforation with peritonitis or fatal haemorrhage does not occur it quickly becomes chronic. Grossly and microscopically this type of lesion resembles the chronic peptic ulcer as found in man.

The third type of lesion studied experimentally appears to begin as gastritis, which involves both the fundic and pyloric mucosa. The fundic lesions heal very quickly, but those in the pyloric mucosa persist as chronic lesions so long as the exciting agent is permitted to act. The pyloric lesions resemble the gastric peptic ulceration as seen in man, except that the experimentally produced lesions are more often multiple.

There are a few conditions in which ulceration of the gastro-intestinal tract occurs where the lesion does not quite correspond to any one of the types mentioned. For instance, peptic ulceration may arise in the animal with an Eck fistula. Here the lesion corresponds to the second type of ulceration described, except that it usually remains acute in appearance and is often accompanied by erosion of the fundic mucosa as a terminal condition. The lesion also often occurs following obstruction to the biliary outflow. Such ulcerations correspond in general to the first type of lesion except that they are prone to perforate. Peptic ulceration also occasionally follows partial removal of the liver, in the condition of cirrhosis of the liver, after the removal of the pancreas or evulsion of the pancreatic ducts, and quite frequently after draining the pancreatic secretion externally. The lesions found in all these instances resemble the second type of ulceration except that they rarely become chronic.

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Peptic Ulceration of the First Type

The methods whereby ulceration of the first type can be produced are too numerous to mention, but the characteristics of the resulting lesions appear to be quite similar regardless of their method of production. Peptic ulcerations of this type are found mainly in the gastric mucosa, and very rarely is the duodenal mucosa involved. The lesions can be separated into two subgroups: one is a widespread superficial erosion; the other is a punched-out ulcer formation. For convenience they will be described as gastric erosions and as ulcers, but the fundamental mechanism of their development appears to be the same. The gastric erosions, which are the usual type of lesion encountered, practically always occur in the fundic division of the stomach, and in most instances the pyloric mucosa is normal. The lesion begins as a widespread haemorrhagic region in the mucosa and develops along the rugae, thus presenting an irregular appearance. The denuded surface is haemorrhagic and the fluid in the stomach usually contains blood. The gastric ulcers are round or oval in shape and vary in size, but rarely exceed 3 mm. in diameter. They are almost always multiple. They vary in position, being found in the fundic and pyloric regions on both curvatures of the stomach, but usually they occur in the prepyloric region. At the onset the ulcers appear as small haemorrhagic regions; when fully formed they penetrate to the muscularis mucosae, with complete loss of epithelium. The walls are smooth, causing the punched-out appearance.

Microscopically the gastric erosions show a loss of surface epithelium of different degrees. Only the surface of the mucosa is affected, the loss of epithelium rarely extending through to the submucosa. Usually the epithelium beneath the ulceration is infiltrated with blood. The ulcers are cone-shaped, with the base of the cone at the surface of the mucosa and the apex at the muscularis mucosae. A small eroded blood vessel can almost always be found at the centre of the base of the ulcer.

The mechanism of the formation of this type of peptic ulceration appears to be as follows. The primary injury is a vascular one. In the gastric erosion form of lesion the vascular injury occurs in the capillaries or small blood vessels in the mucosa; in the ulcers it occurs in an arteriole located in the submucosa. Following the vascular injury and infiltration of the mucosa with blood there is a destruction of the epithelium in the region where the blood supply is affected.

Second Type of Ulcer

We have studied the second type of peptic ulceration in greater detail, both because it appears similar to the chronic lesion of man and because the development of successful methods for its experimental production and healing made possible the study of the complete life history of the lesion. The ulcer has been observed through the various stages of its development from the time it could just be recognized as a pathological process up to several months after it had the characteristic appearance of the chronic lesion. Then, in turn, the healing process of the chronic lesion has been observed in detail until restoration was so complete that it was impossible to recognize grossly that an ulcer had existed.

METHODS OF PRODUCING THE ULCER

The fundamental procedure necessary to produce this type of peptic ulceration is to expose the mucosa of the intestine to the acid gastric content by the elimination of the mechanism which normally produces the necessary diluting, neutralizing, and buffering secretions. This can be accomplished by (1) removal of the duodenum, (2) draining a fundic pouch with an isolated loop of intestine, or (3) transplantation of the common bile duct and pancreatic ducts to the terminal segment of the ileum. Peptic ulcer will develop in a high proportion of instances, following the above procedures, in the intestinal mucosa adjacent to the site of emergence of the gastric content. However, the most successful method of producing chronic peptic ulcer is as follows. The pylorus is sectioned and the distal end closed, and the jejunum is transected a few centimetres distal to the ligament of Treitz. The distal end of the jejunum is anastomosed to the pylorus and the proximal end anastomosed to the ileum within 40 cm. of the termination of the latter. These procedures cause the gastric content to be expelled from the stomach into the intestine, without becoming mixed with the secretions normally poured into the duodenum—the bile, the pancreatic juice, and the duodenal secretion, which are now drained into the ileum. If this procedure is carried out correctly, peptic ulceration will occur in more than 90 per cent. of the cases.

GENERAL CHARACTERISTICS OF THE ULCER

The ulcer thus produced is grossly and microscopically similar to the lesion as seen in man. The ulceration usually develops within two to three weeks after exposure of the mucosa to the gastric content. The site of development of the ulcer is very constant. The lesion forms a few millimetres distant to the pyloric mucosa and usually on the postero-lateral aspect of the intestine. The site of formation of the ulcer is always just distal to the point of emergence and in the direct pathway of the gastric content. Usually only one ulcer occurs, but sometimes a contact ulcer is present, and rarely three ulcers are found. The ulcer usually develops rapidly, and the interval from the time of the first visible signs of mucosal injury to the time a lesion is well formed may be but a day or so. When fully formed the ulcer varies from 4 to 15 mm. in diameter and is round or elliptic in shape. The ulcer exhibits a punched-out appearance with overhanging edges. The lesion always progresses until it involves the entire thickness of the mucosa, and usually penetrates considerably deeper into the intestinal wall. The base of the ulcer is hard on palpation, and on section thick and sometimes oedematous. Microscopically there is destruction of the mucosa and of the intestinal wall down to the base of the ulcer, with leucocytic infiltration and initial proliferation of connective tissue.

DEVELOPMENT OF THE ULCER

The ulcerating process always begins at the surface of the mucosa. At first all that can be seen is an oval or circular area covered with a homogeneous grey membrane. Microscopical examination of the lesion at this stage shows that this membrane is very thin, involving only the surface cells, and that it is composed of mucosal cells in various stages of necrosis, leucocytes, and erythrocytes. With the exception of small regions of haemorrhage between the tubules just beneath the membrane, the rest of the tissue appears normal. If the membranous layer is gently sponged and rubbed off, a slight depression is uncovered, where the surface of the mucosa has disappeared and which bleeds profusely. This formation of grey membrane composed of cell debris is constantly occurring, and the surface of the membrane, which is older and consists of the more severely injured cells, is constantly being eroded by the gastric content passing over it. The ulcer is saucer-shaped until the muscularis is reached. The muscularis is at first penetrated by the

pathological process to a slightly greater extent peripherally than the mucosa, undermining the latter and causing the characteristic punched-out appearance of the fully developed lesion. In association with penetration of the mucosa, infiltration of leucocytes and proliferation of fibroblasts and mucosal cells occur at the periphery of the injured region. Shortly after the ulcerating process has started, bacteria in varying numbers can be found at the periphery of the lesion, and the amount of fibroblastic proliferation appears to depend to a considerable extent on the degree of secondary infection.

While it has been necessary to describe the development of the ulcer by stages, it really is a continuous process, the essential features of which are identical in all lesions. This same statement also applies to the process of healing. This occurs simultaneously with the developing process, but the lesion does not heal unless it has been partially or completely protected from the gastric content. In the unprotected ulcer the delicate growing edge of granulation tissue covered with a single layer of mucosal cells, which is the initial stage of the healing process, is injured and swept away by the gastric content as soon as it has progressed beyond the protecting edge of the periphery of the lesion.

METHODS OF CAUSING THE ULCER TO HEAL

The ulcer can be made to heal very quickly by completely protecting it from the gastric content. This is accomplished by closing the opening of the intestine proximal to the ulcer at the pylorus and draining the stomach by gastro-enterostomy. However, often before the ulcer has healed another ulcer develops in the efferent loop of the jejunum draining the stomach, perforates, and causes death. This latter occurrence can be avoided if at the time the gastro-enterostomy is performed the duodenum is drained back into the jejunum just distal to the gastro-enteric stoma. The ulcer can also be made to heal by draining the duodenum back into the jejunum in the region of the lesion; but under this condition the healing process is not orderly, as when the lesion is completely protected from the gastric content. The healing of the ulcer will also follow simple gastro-enterostomy; but here, also, the healing process is complicated and retarded by injury resulting from the gastric content passing over the lesion.

HEALING OF THE ULCER

The process of healing of the protected ulcer is very characteristic, and occurs in a uniform and progressive manner until the lesion is completely healed. Within just a few hours after the ulcer has been protected from gastric content flowing over it, the base of the ulcer becomes covered with a thin fibrinous membrane; the leucocytes and bacteria begin to disappear beneath the protection of this membrane, and the growing granulation tissue and mucosa are able to advance from the periphery over this supporting structure covering the base. The granulation tissue grows faster than the mucosa, and eventually fills the whole ulcer and usually extends over the edge of the lesion. Concomitant with the proliferation of the granulation tissue, the periphery of the lesion moves inward, the diameter of the lesion becoming thereby greatly decreased.

The growing edge of mucosa consists of a single-celled layer of flat cells, which are not at first attached to the supporting granulation tissue. While proliferation of the mucosal cells appears to occur throughout the growing surface, it is fastest at the periphery of the ulcer, so that the advancing edge of mucosa seems to be pushed over the surface of granulation tissue. Sufficient pressure is soon developed in this most rapidly proliferating region to cause simple folds of mucosa to appear adjacent to the normal mucosa at the periphery of the ulcer. The first fold at the growing edge of the ulcer and nearest the centre of the lesion usually has an elongated slope on the side of the advancing edge that is very characteristic.

As previously stated, the growing edge of granulation tissue usually overflows the sides of the ulcer, giving a mushroom appearance. When the growing edge of mucosa, which is protected by overhanging granulation tissue, reaches the stalk of this mushroom, it passes upwards and may cover the whole surface of the granulation tissue, even that portion which is beyond the edge of the ulcer. Eventually, however, the stalk of the mushroom of granulation tissue with its covering of mucosa is squeezed off and discarded, leaving the whole surface of the lesion covered with the mucosa which has been developing under the protection of the granulation tissue. When the granulation tissue has filled the base of the ulcer completely, the lesion can be recognized by the raised pearly white appearance of the newly formed tissue. The healing tissue is very delicate at this stage, and can be washed out by dropping water on it with a medicine dropper, leaving the appearance of the ulcer almost identical with that before the lesion was protected. The whole healing process occurs in a very orderly fashion, and, when completed, the site of the ulcer, as has been said, usually cannot be distinguished grossly. Microscopically the site can be recognized because the restored surface of the mucosa is thinner than normal, contains atypical villi, and, since smooth muscle does not regenerate, the mucosa over the ulcerated area rests on a connective-tissue base instead of the muscularis mucosae.

THE CHRONICITY OF THE ULCER

Studies of the processes of development and healing of the experimentally produced peptic ulceration have indicated the mechanism causing the lesion to become chronic. The same agencies that are responsible for producing the ulcer prevent its healing. The same cellular changes that constitute the essential elements of the healing process can be found to a varying degree in all ulcers. An ulcer begins to heal as soon as the initial injury occurs. The processes of tissue destruction and tissue repair take place simultaneously from the incipiency of the lesion; but the former, in the developing lesion, always predominates, because the new cells formed in the process of healing are destroyed by the acid or swept away by the passage of the gastric content before they have had an opportunity to establish themselves as an integral part of the tissue. The destructive processes which produce the ulceration and the reparative processes which cause the lesion to heal go on at the same time constantly throughout the life cycle of the ulcer, except when it is completely protected from the gastric content. In the unprotected ulcer, exposed to the gastric content, each protective covering of granulation tissue formed over the base of the ulcer is destroyed before healing can take place beneath. The delicate cells of the mucosa developing in the edge of the ulcer are killed or swept away by the gastric content passing over them. Only when the ulcer is protected from the gastric content to such a degree that the ever-present reparative processes can take place faster than the destructive processes does healing occur.

COMPLICATIONS OF THE ULCER

All the complications of peptic ulcerations as seen in man have been observed in experimentally produced lesions of this type. The more important complications have been perforation of the lesion and haemorrhage from

the ulcer. A very high percentage of experimentally produced ulcers perforate. The perforation may occur very quickly, with resultant leakage of intestinal content and peritonitis. Another viscus may be pierced, such as the gall-bladder, colon, or a loop of intestine. The perforation usually is closed by the surface of an adjacent organ, or, especially, the omentum. In some instances the perforated ulcer shows one or two terraces, indicating that there has been more than one active onslaught in its creation. A few ulcers have even perforated through the abdominal wall, producing a fistula.

Haemorrhage from the experimentally produced ulcer is a frequent occurrence, and death of the animal from loss of blood at the site of the lesion is not uncommon. The haemorrhage occurs from one of two sources. Rarely, the pathological process involves an artery, producing necrosis of the arterial wall with a resulting loss of blood. Usually the bleeding occurs from an injured surface of the granulation tissue in a healing lesion. As previously described, in the healing process the base of the ulcer is filled with a very vascular granulation tissue. Injury to this newly formed vascular bed easily occurs, and may be followed by a haemorrhage of sufficient magnitude and continued for a long enough time to cause death. The ulcers more prone to bleed are those healing under a condition of partial protection. For instance, if gastro-enterostomy is carried out on an animal with ulcer, thus diverting a portion of the gastric content from passage over the lesion, the ulcer will slowly heal. While the ulcer is in the process of healing, the gastric content that does pass over the lesion frequently injures the delicate growing and developing granulation tissue in the base, and a haemorrhage often ensues. A coarse diet is more prone to cause bleeding than a liquid one. The fully protected healing ulcer—that is, a lesion from which gastric content is completely excluded—has never been the site of a demonstrable haemorrhage in our experiments.

The Third Type of Ulceration

The third type of peptic ulceration we have studied comprises those lesions produced by a single agent, cinchophen. The entire life history of the gastro-intestinal lesions produced by the administration of cinchophen has not as yet been fully observed, but enough is known to warrant a consideration of these lesions separately. The lesions produced by cinchophen appear to be a combination of the two types of lesions previously discussed.

The administration of a sufficient amount of cinchophen over a sufficient period to dogs that eat their daily ration produces gastro-intestinal ulcerations in a high proportion of animals. The lesions are mainly gastric; rarely is the duodenum involved. Shortly after the administration of an effective amount of cinchophen an acute gastritis develops, with multiple erosions, involving both the fundic and pyloric lesions. The gastric lesions at this stage appear similar to those described in the first type, but usually are more severe and widespread. An accompanying haemorrhage is a very prominent feature of these lesions. The multiple acute ulcerations throughout the fundic mucosa and in most of the pyloric mucosa heal rapidly, usually leaving a single chronic ulcer in the pyloric mucosa. The chronic lesion is situated from 2 to 3 cm. from the pyloric ring on the lesser curvature and posterior wall of the stomach.

The chronic ulcer is large and punched out, with overhanging edges and a necrotic indurated base. The lesion has a great tendency to perforate, and often penetrates the entire thickness of the gastric wall. The chronic ulcer produced by cinchophen heals after the administration of the drug is discontinued. The healing process, which is active during the entire life of the ulceration, begins to be effective within three days of the withdrawal of cinchophen, and the lesion is completely healed within three weeks. The healing process is similar in all respects to that described for the ulceration of Type 2. As previously stated, the life history of the cinchophen ulcer has not been observed completely. The mechanism of development appears to be similar to that described for the ulceration of Type 1, in that the initial lesion seems to be a vascular one, involving a very large region of the gastric mucosa. The cinchophen ulceration differs from those of Type 1 in that some of the lesions in the pyloric region become chronic and will perforate.

Summary

There are at least two mechanisms of development of the experimentally produced peptic ulcerations. One mechanism involves initially the blood supply to the ulcerated region. The life history of the lesions produced by this mechanism is not completely known, because the methods for producing them usually result in death to the animal. The other mechanism has been summarized in a previous paper as follows (Mann, 1937):

The site, character, extent, processes of development, and healing of the ulcer depend to a very large degree on an anatomical and physiological basis. The important factors in the development of the lesion are chemical and mechanical. The typical lesion of peptic ulcer occurs in a mucosa exposed to acid gastric content which is not protected by the mechanism for diluting, buffering, and neutralizing the acidity of the gastric content. It never occurs in a mucosa not exposed to acid gastric content. The ulcer begins with injury and destruction chemically of the surface cells of the mucosa with which the acid gastric content comes in contact. The site of the ulcer is determined by the mechanical factor of expulsion of the gastric content—that is, it occurs in the region where the gastric content first strikes after emergence from the stomach. Progression of the lesion is due to the mechanical erosion of succeeding layers of the injured surface cells and chemical injury to the living cells previously protected by the dead cells above. Limitation of the lesion is determined by the area over which an effective degree of acidity for cellular injury can be maintained. Chronicity of the lesion is brought about by the same two important factors producing the lesion—by destroying chemically and washing away mechanically the delicate newly formed proliferating cells as soon as the healing edge has progressed beyond the periphery of the ulcer. Healing of the lesion always occurs immediately after it is protected from the acid gastric content.

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A. Biemond (*Nederl. Tijd. Geneesk.*, 1939, **83**, 1234), who records his observations on 250 cases of disseminated sclerosis treated at the Neurological Clinic of the Wilhelmina Hospital at Amsterdam between January, 1928, and December, 1937, maintains that drug treatment of this condition has hitherto proved entirely ineffective. The type which offered an apparently favourable response to treatment was just that which tended to show spontaneous remissions. Operative treatment by bilateral stellate ganglionectomy is inadvisable as it is theoretically unsound and not free from danger.

TREATMENT OF GONORRHOEA BY M & B 693

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From time immemorial man has sought for the medicine that cures gonorrhoea. The quest was sociological as well as medical. The wish now seems almost to be fulfilled. Whitby (1938a) first directed attention to the new drug, 2-sulphanilyl-amidopyridine (M & B 693), a derivative of the original prontosil discovered by Domagk and his assistants. Lloyd, Erskine, and Johnson (1938a) and one of us, F. B. (Bowie, 1938), later noted the early results of its clinical application to gonorrhoea. Since then more evidence has been produced to show that this new preparation must be regarded among the important recent developments in modern campaigns against the gonococcus, if not actually as the most important. More detailed reports by Lloyd *et al.* (1938b), by Prebble (1938), by Batchelor and his co-workers (1938), and by McGregor-Robertson (1938) all indicate that M & B 693 in gonorrhoea is the equivalent of 606 in syphilis. The account now presented contributes further to the highly encouraging reports hitherto published on the action of M & B 693 in gonorrhoea.

General Survey of the Series of Cases

The series under review consists of 127 cases of gonococcal infection in the male treated with M & B 693. Female cases of gonorrhoea occurring throughout the period when these male cases were under observation are not included, as it is deemed advisable that they be observed for a much longer time before any assessment is made of the results of treatment; but preliminary observations in these cases, as in cases of vulvovaginitis and of gonococcal ophthalmia, suggest that results will be analogous.

Of the 127 male cases, 118 were uncomplicated infections of the anterior urethra, and nine showed evidence of more extensive infection. These nine comprised three cases of prostatitis, five of epididymitis, and one of polyarticular arthritis. The duration of infection before treatment with M & B 693 varied from a few hours to over 300 days. Among the anterior uncomplicated cases, treatment was instituted in seventy-nine patients within seven days of the onset of signs and symptoms—in sixty-eight cases within five days; in fourteen cases between eight and fourteen days; in seven between fifteen and twenty-one days; and in eighteen between twenty-two and 315 days. In the nine complicated cases treatment was begun at from fourteen to 154 days from the onset of manifest evidence of the disease, with complications present for from five to ninety-two days. Eighteen of the simple anterior and one of the complicated cases had received treatment before the administration of M & B 693. This previous treatment consisted of urethral lavage with potassium permanganate 1 in 8,000, oral administration of benzylsulphanilamide (proseptasine), sulphanilamide, prontosil, and, in one case, intramuscular injection of gonococcus antitoxin. Twenty-four of those treated with M & B 693 were given, in addition, urethral lavage with potassium permanganate for periods varying from five to fourteen days. All cases were gonococcus-positive at or up to the time of the first dose of M & B 693.

Dosage Employed

As is natural in the use of any new drug, various schemes of dosage were tried at the outset. Seventy-nine of the cases were given 1 gramme thrice daily as the initial dose. The period of maintenance of this initial dose was not fixed, but varied with clinical response, and in most cases was four to five days, after which the dose was reduced to 1.5 grammes daily for a further three to four days. A few patients (eight) were tried on an initial dosage of 0.5 gramme thrice daily, for periods of from six to twenty days in successful cases, longer in others. This reduction in dose was made by way of experiment, but, in view of the obvious superiority of both clinical and bacteriological response to the larger initial dosage, this method was soon abandoned. In another series (seventeen) the initial dose was increased to 1 gramme four times daily for four to five days, then 1 gramme thrice daily for one or two days. Finally, a fourth group (twenty-three) was treated by a more intensive method, consisting of an initial dose of 4 grammes, followed in four hours by 2 grammes, then in another four hours by 1 gramme, and continued at a dose of 1 gramme four-hourly during waking periods, for a total treatment time of three to four days. This intensive treatment is discussed more fully later.

Estimation of Cure

As the standard of the estimation of cure is important in the evaluation of the results of treatment, it is necessary to be somewhat detailed in the conditions which were requisite in this series of cases before patients were regarded as being cured.

After cessation of treatment, by which time the patient was judged likely to be cured, a preliminary period of observation of from three to four weeks, average twenty-five days, was instituted before any tests were applied. During this time it was essential that the particular case be free from any visible or palpable evidence of infection, in that there should be no urethral discharge and no visible pus or debris in the urine and there should be no other recognizable signs of infection in the lower genito-urinary tract. At the end of this interval, provided clinical examination was negative, the first of two tests was given. The test consisted in the passing of the largest sound that would enter the external urinary meatus; massage of the prostate and of the seminal vesicles, with smear examination of the secretion; massage of the anterior urethra; the taking of blood for the gonococcal complement-fixation test; the injection of 1 c.cm. of Parke, Davis's mixed gonococcal vaccine (1 c.cm. containing 500 million polyvalent gonococci); and the instruction to the patient that he must not pass urine for at least three hours after the test. In two to three days the patient returned and was examined for any urethral discharge and for any urinary or other evidence of his infection. The prostate and the seminal vesicles were massaged, and a smear and a culture of the secretion investigated. Any urethral discharge or secretion, and, if doubtful, a centrifuged urinary deposit, were dealt with similarly. Then in four to five days, to complete the week, the patient was re-examined, the same clinical and laboratory procedures being carried out.

After a second observation period of an average of twenty-eight days the second test was applied. This and the subsequent investigations were identical with the first, except that, where the complement-fixation test had already been negative, it was now omitted. As a last measure, one to two weeks

after the completion of the second test the patient was examined by urethroscopy. The usual requirements of clinical and laboratory findings were maintained. Clinically, it was essential that there be freedom from signs and symptoms of gonorrhoea. From the laboratory point of view, smears and cultures were free from gonococci; smears were free from pus cells, except an occasional leucocyte in prostatic slides; and the gonococcal complement-fixation test was negative, or, if previously positive, finally negative.

The standard of cure rested, therefore, on two clinically negative periods of observation and on two examinations and two tests of cure, each test completed by two further examinations. The first and second tests were made at an average of twenty-five and sixty days respectively, and completed at an average of thirty-two and sixty-seven days respectively; while the final observation, urethroscopy, was performed on an average of seventy-four days from the cessation of treatment. The sum total thus consisted of at least seven investigations over an average period of from three and a half weeks to two and a half months from the termination of treatment. One group of eight patients passed satisfactorily the first of the tests of cure, but did not undergo the second. According to the standard of double tests, such cases were technically defaulters; but when it is realized that the single test in itself is regarded as sufficient by some workers, with perhaps the proviso that a longer period between cessation of treatment and test of cure is advisable, it is likely, in view of the general trend of results, that these cases were also cured. It may be of some significance that among those who passed double tests of cure none failed in the first test.

TABLE I.—*Showing Results of Various Initial Dosage Groups in 127 Cases*

Initial Dosage Groups	No. of Cases	Results, showing Numbers of Cases, Average Total Dosage, and Average Duration of Treatment														
		Cured: Passed Two Tests			Probably Cured; Passed One Test			Doubtful			Transferred			Resistant		
		Cases	Gm.	Days	Cases	Gm.	Days	Cases	Gm.	Days	Cases	Gm.	Days	Cases	Gm.	Days
0.5 gm. t.i.d.	8	5	17.3	10.4	—	—	—	—	—	—	1	22.5	15	2	68.2	28
1 gm. t.i.d.	79	56	18.8	7.9	5	24.7	10.2	13	23.5	10	3	16.3	8.3	2	36.2	19.7
1 gm. q.i.d.	17	10	16.3	5	2	18.5	5	2	18.5	5	1	16	5	2	41.5	16.6
4-2-1 gm.	23	20	20.1	4.1	1	14	2	2	9	2	—	—	—	—	—	—
Totals	127	91			8			17			5			6		

Details of Results of Treatment

The results of treatment are classified under the following groups: cured, probably cured, doubtful, transferred, and resistant cases. Table I shows, in addition to dosages, the results of M & B 693 therapy generally.

Cured.—Ninety-one patients, or 71.7 per cent. of all cases treated, consisting of eighty-seven cases of anterior urethritis, one of prostatitis, two of epididymitis, and one of polyarticular arthritis, passed double tests of cure.

Probably Cured.—Eight patients, or 6.3 per cent. of the whole, passed one test. These comprised seven cases of anterior urethritis and one of epididymitis. The probabilities of cure have already been mentioned.

Doubtful.—Such cases numbered seventeen, or 13.4 per cent. of all, and were made up of fourteen cases of anterior urethritis, two of prostatitis, and one of epididymitis. Details of individual cases are not necessary. Suffice it to state that all defaulted before they could be placed in a more satisfactory category of results. Two (mentioned under "Relapses") actually passed one test of cure, but, because of histories of relapse or, more likely, of reinfections, were not included in those probably cured. Four others arrived at the stage when they were given, but did not complete, first tests of cure. The remainder were definitely doubtful, defaulting at various periods up to forty-two days from the completion of treatment. So far no patient of this group has indicated, by letter or by return to the clinic, the possibility of the persistence of infection.

Transferred.—Five cases, or 3.9 per cent., all of anterior urethritis, were transferred to other clinics or to the care of their own doctors, having first remained clinically and bacteriologically free from infection up to seven days from cessation of treatment.

Resistant.—Six patients, or 4.7 per cent. of the series, did not respond, other than temporarily—two not even temporarily—to M & B 693. These cases are dealt with later.

The total number of defaulters—that is, those who did not complete the original standard of two tests—was twenty-five (19.7 per cent.). This is really not a high rate in view of the fact that eight of these (technically) defaulters passed a substantial test of cure, leaving seventeen cases (13.4 per cent.) of real defaulters, and here again, there are possible cured cases. Among those transferred there may be other successes. The institution of double tests of cure was, and probably will be, a severe strain on the loyalty of the patient, who, because of anxiety to escape from the clinic as soon as possible on account of fears of ultimate discovery and exposure, or who, because of being resident in some rural area from which attendance is irksome, finds it difficult to reconcile the necessity for multiple examinations over a prolonged period with what was apparently a simple infection cured in a few days, merely by swallowing a few tablets. Adequate follow-up control, however, is of great importance, and is a point to be remembered by all those who would employ M & B 693 in the treatment of gonorrhoea.

Relapses or Reinfections

Relapses, or possibly reinfections, occurred during treatment or subsequent to the conclusion of treatment in seven cases. One was a patient on the lowest dosage of 0.5 gramme thrice daily. After being gonococcus-negative on the second and third days, he relapsed while under treatment, and showed gonococci from the tenth to the fourteenth day, thereafter becoming permanently negative. Six other cases relapsed or were reinfected at intervals of from six to fifty days after the termination of treatment. Actually in all six exposure to possible infection was admitted, in one case with the original source of infection—a woman who could not be prevailed upon to visit the clinic. To all six cases further treatment was given. Four were ultimately classified as cured. A fifth and a sixth passed one test of cure quite satisfactorily, but, because of their histories, are placed with the seventh—a defaulter after cessation of treatment—in the group of doubtful cases.

Cases Resistant or Responding only Temporarily to M & B 693

It is hardly to be expected that out of 127 cases there should not be any who would not respond to treatment. Six failed to do so other than temporarily. Some details of these are set forth in Table II.

TABLE II.—*Cases Resistant or Responding only Temporarily to M & B 693*

Case	Type of Case	Duration of Disease	Treatment by M & B 693				Response later to
			Initial Dosage	Total Dosage	No. of Courses	Total Time	
1	Ant. ureth.	4 days	0.5 gm. t.i.d.	35 gm.	1	21 days	Sulphanilamide
2	,,	12 ,,	,,	101 gm.	5	35 days	Urethral lavage
3	,,	1 day	1 gm. t.i.d.	43 gm.	1	15 days	,, ,,
4	,,	4 days	,,	51 gm.	2	14 days	,, ,,
5	,,	2 ,,	,,	26 gm.	2	7 days	Sulphanilamide and urethral lavage
6	Epidid.	7 ,,	1 gm. q.i.d.	41 gm.	2	11 days	,, ,,

Objection may be taken to Case 5 of the series, a patient who had only seven days' treatment; but he received 14 grammes over five days at the rate of 1 gramme thrice daily and relapsed, and then 12 grammes at an intensive rate over two days and again relapsed. Experience by then was beginning to indicate that in such cases the principle of ringing the changes could be employed with profit, and the treatment by M & B 693 was terminated and another substituted.

Should Treatment by M & B 693 be Delayed till Immunity Develops?

Whatever may be the outcome of opinion regarding the advisability or otherwise of suitable delay in the use of other members of the sulphonamide group in the treatment of gonorrhoea, there seems to be little evidence so far of any divergence of view as to what should be the procedure in the case of M & B 693.

Lloyd *et al.* (1938b) write: "Many must consider, as we do, that the deliberate imposition of a delay period in the early and highly infectious stage is likely to be dangerous. There are many undesirable factors associated with such delay: the anxiety of the patient at the persistence of symptoms, the infectivity of the discharge, the approach of the danger period for complications, the likelihood of patients defaulting—all these are of great importance and render the control of the disease an objective to be attained at the earliest possible moment. The desirable chemotherapeutic agent is one that can be used with effect at the earliest stage of the disease, and we consider that the introduction of M & B 693 fulfils this requirement." Prebble (1938) states that "it therefore appears advisable to start treatment right away with irrigation and with M & B 693." Batchelor *et al.* (1938) consider that "there is no necessity to wait for immunity to develop; M & B 693 should be given as soon as the diagnosis is made." McGregor-Robertson (1938) is of the opinion that "delay in starting treatment is unnecessary and undesirable."

The question is one which may yet have to be answered in final terms of more adequate data, but so far as our experience goes we have no hesitation in stating that M & B 693 should be administered at the earliest possible moment. There is more to be considered than the mere fact that one form of treatment may give results slightly superior to those of another. Venereal disease, including gonorrhoea, is unfortunately not always confined to the individual, but is apt to spread; and, results being equal, or approximately equal, that treatment which takes effect at any stage of an infection, but particularly in the early stages, is always to be preferred. Table III gives the details of eighty-nine cured cases, divided according to whether treatment was begun within seven days or later than one week from the onset of signs and symptoms.

TABLE III.—*Showing the Average Time, in Days, for Eighty-nine* Cured Cases to become Gonococcus-negative (Sixty-one Treated during the First Week of Disease and Twenty-eight Afterwards)*

Initial Dosage	No. of Cases	Treatment During 1st Week		Treatment After 1st Week	
		Cases	Gc.-neg. in	Cases	Gc.-neg. in
0.5 gm. t.i.d. ..	5	2	9.0 days	3	7.7 days
1 gm. t.i.d. ..	54	38	2.4 ,,	16	2.4 ,,
1 gm. q.i.d. ..	10	6	1.5 ,,	4	3.0 ,,
4-2-1 gm. ..	20	15	2.1 ,,	5	1.8 ,,

* The total number of cured cases was ninety-one, but two—one in each group of the 1 gm. t.i.d. division—are omitted because of irregularity in observation rendering assessment of response difficult.

Other cases, not included in Table III but treated with M & B 693, totalled thirty patients—eight probably cured, seventeen doubtful, and five transferred. Taking these together, irrespective of initial dosage, the results were:

Treated before 7th day—14 cases: Average time to become gonococcus-negative, 2.1 days.

Treated after 7th day—16 cases: Average time to become gonococcus-negative, 3.5 days.

In the case of the six resistant patients the duration of infection before treatment varied from one to twelve days, average five days. There is thus little difference between the results of early and delayed treatment. It may be stated that these figures are probably somewhat in excess of what actually occurred. Because of the considerable proportion of seafaring and of rural patients among those treated, it was not possible to see all patients daily in the early stages of treatment, and some may have become negative before the actual entry to this effect in their respective case-sheets. Taken all over, treatment begun up to the end of the first week gave results slightly superior to those of treatment instituted after the seventh day. In view, however, of the general considerations of management of gonorrhoea, there is no doubt as to which is the more desirable method.

M & B 693 Alone *v.* M & B 693 plus Urethral Lavage

Another point which remains to be decided is whether optimum results may be achieved with M & B 693 alone or whether the addition of urethral lavage is essential. Lloyd *et al.* (1938b) do not differentiate between the two. Prebble (1938) considers the combination of M & B 693 and lavage to be the better method. McGregor-Robertson (1938) indicates that irrigation increases the efficiency of the oral method. Batchelor *et al.* (1938) state that "no irrigations or other adjuvant treatments are necessary." Irrigations in our series were given "mainly for psychological reasons" (Bowie, 1938) throughout the transitional stage between the old method of treatment by lavage and the new mode of oral therapy. Only twenty-four such patients received urethral lavage (potassium permanganate 1 in 8,000). The number is too small to be of significance by comparison, particularly if subdivisions be made into M & B 693 dosage groups. There was no difference in the time taken by cases to become gonococcus-negative. Actually the duration of treatment was longer in those

on lavage than in the case of those on M & B 693 alone; but no real opinion can be given, as this was the trial stage of various doses and of various durations of treatment by M & B 693. On the other hand, there is no reason to suppose that lavage would enhance the final results. The fact that three of six resistant cases later responded to lavage alone, and two to lavage plus sulphanilamide, might be indicative of the advisability of lavage as a routine measure. But there will always be exceptions, and it is probably safe to assert that the abolition of lavage as a routine would be to the advantage of all concerned—those suffering from gonorrhoea and those engaged in treating it. The excellent results of M & B 693 alone certainly do not call as yet for any revision of our opinion that there does not seem to be any necessity for the at least wearisome, if not at times harmful, rites of urethral lavage.

Complications

Before Treatment.—Nine cases had developed complications before treatment. It is always difficult to estimate when any complication has resolved, as, apart from clinical opinion, an apparent physical resolution does not necessarily mean a bacteriological cure. So far as could be judged, three cases of prostatitis resolved in from five to fourteen days; four cases of epididymitis recovered in from six to fourteen days; and one case of polyarticular arthritis was free from all disabilities by four to five weeks. (Another case, of epididymitis, fell into the resistant group.)

During Treatment.—The foregoing results, however, are of less importance than another feature of the effect of M & B 693. One of the great attributes of this drug is the remarkable absence of complications in cases where it has been exhibited before the onset of the danger period. Complications subsequent to treatment developed in two cases only, and these were in the resistant group. In all the other groups, totalling among them 121 cases, not one complication was found. The two instances noted were one of peri-urethral abscess and one of epididymitis.

Toxic Reactions

The incidence of toxic manifestations was related to the dosage—not so much the length of treatment as the intensity of treatment. Table IV shows the distribution of toxicity in relation to amounts given. The comparative degrees of mild and severe were assessed from information supplied from patients, and, as is natural under such conditions, are of approximate accuracy.

TABLE IV.—*Incidence of Minor Toxic Reactions in 127 Cases, Classified into Mild and Severe Degrees*

Initial Dosage	No. of Cases	Mild Degrees		Severe Degrees	
		No.	Per cent.	No.	Per cent.
0.5 gm. t.i.d. ..	8	2	25	0	0
1 gm. t.i.d. ..	79	24	30.4	5	6.3
1 gm. q.i.d. ..	17	11	64.7	1	5.9
4-2-1 gm.	23	13	56.5*	5	21.7*

* This high incidence was found only during the first twenty-four hours of treatment.

Generally speaking, the higher the daily dosage the greater the incidence of toxic reactions. That of the third group, 1 gramme four times daily, is unexpectedly high. This was actually the minimum dosage at which treatment was maintained in the fourth, or 4-2-1 gramme, group: in this latter group a high proportion of toxic manifestations was recorded during the first twenty-four hours of treatment; then the general incidence fell to that, roughly, of the second, or 1 gramme thrice daily, group. It may be that in the smaller number of the third group a proportionally higher incidence of reactions occurred by chance. Further reference to the toxic effects in the 4-2-1 gramme group is made later on. A point worthy of comment is that at the rate of 1 gramme thrice daily the number showing toxic effects did not exceed 37 per cent. The side-effects noted were: drowsiness, lassitude, general sense of malaise with no complaint in particular, headache, nausea, vomiting, insomnia, generalized pruritus, dyspnoea with mild methaemoglobinaemia (two cases), mild cyanosis, and sweating at night. No rashes occurred in this series, though in two female cases at present under observation a generalized scarlatiniform eruption developed, in one case mostly on exposed areas. None of the more serious toxic effects was encountered. Though as yet there is no effective method of completely neutralizing toxic results, a noticeable feature was their transient nature, subsiding rapidly as they did on withdrawal of the drug.

Intensive Treatment

For some time an intensive form of treatment has been in operation in roughly every second male case of gonorrhoea. Twenty-three cases of such treatment are included in this series.

The method is referred to in the clinic as the "8-4-2" treatment, styled in tablets (of 0.5 gramme) instead of grammes, as a patient naturally counts his dosage in tablets. Up till now this treatment has been confined to those within easy reach of the clinic, in case any necessity arose for re-attending before the time fixed for the next examination. Under this system the patient is made to swallow eight tablets (4 grammes) on the spot—that is, before he leaves the examination room. He is then given detailed instructions regarding general considerations of behaviour, including the special precautions in taking drugs of the sulphonamide group, and is told to take four tablets (2 grammes) in another four hours; then, at four-hourly intervals during waking hours, two tablets (1 gramme), until the end of a period of roughly seventy-two hours from the beginning of treatment. Modifications of dosage develop as a matter of course, depending upon whether treatment be started in the morning or in the evening; but as a rule the actual amounts of M & B 693 taken aggregate from 6 to 8 grammes on the first day and from 4 to 6 grammes on the second and third days. Treatment may be prolonged for another day or so at the same rate or at a lower rate of 1 gramme thrice daily, depending more on the clinical response (freedom from discharge) than on the bacteriological results. In several of these cases it was noted that a small mucoid bead was expressible from the urethra on the day on which treatment was terminated. In this secretion gonococci were still present, but by the following day, without further administration of M & B 693, all trace of discharge had disappeared, and the cases subsequently remained completely negative, both clinically and bacteriologically. These observations suggest confirmation in the clinical field of the experimental findings of a "lag" phenomenon in the mode of action of M & B 693 (Whitby, 1938b).

It is not claimed that this may be the best or even the most desirable form of treatment, but it does appear to merit further trial; and from an opinion expressed by Whitby (1938b), and from our clinical experience, two considerations are important: the first is that sulphonamides, on the whole, perform their work either speedily and efficiently or slowly and imperfectly; the other is that the major, or dangerous, toxic effects are more likely to arise from prolonged treatment than from brief treatment.

Against the use of the 8-4-2 tablet (4-2-1 gramme) scheme, of usually from three to four days' duration, is the initial high incidence of toxic reactions—78 per cent. of cases. Only roughly 22 per cent. of these were severe in degree, the remaining 56 per cent. being mild. Details are given in Table IV, but, in addition to the information supplied there, it may be repeated that the high initial incidence of toxicity lasted merely for twelve to twenty-four hours, after which it dropped to that found in the 1 gramme thrice daily dosage, in which the general incidence of toxicity was only 37 per cent. This transient state of malaise was probably no greater than that experienced by most of the patients during the twenty-four hours subsequent to the general conditions of dissipation leading to infection. As yet, toxic manifestations, even if severe, have all been of the minor varieties, and repeated blood examinations have so far failed to indicate any necessity to abandon this technique.

In favour of the 4-2-1 gramme method are several considerations. In the series of twenty-three cases so treated, twenty were cured, one probably cured, and one of the remaining two passed the first test of cure, but because of a relapse, admittedly a possible reinfection, was classified with the other as being doubtful. No instance of resistance was noted, while in 104 other cases six such failures occurred. These figures may be too small to be of great importance, but there are at least theoretical advantages to be considered. It is reasonable to assume that an abrupt intensive attack will always mean a more swiftly deleterious effect upon the gonococcus, by which attack the infection may be eradicated more quickly and efficiently, and by which may be avoided the development of what may yet become known as M & B 693 resistance. Further, as has already been suggested, the avoidance of serious toxic results may possibly be effected more by short rigorous treatment than by prolonged, though milder, methods. Finally, it is a point worth knowing that, if necessity arises, a man may be cured of gonorrhoea by treatment lasting only three days, or even less!

Comments

That M & B 693 is a remarkable drug cannot be questioned. What may be, and probably will be, debated for some time is how best to employ it: early during gonorrhoea or later on in the disease; in short intensive courses, single or multiple, or by more prolonged easy-going methods; with or without urethral lavage, or perhaps with or in alternation with some other forms of adjuvant treatment yet to be devised; how long it should be given to apparently resistant cases before trying some other method of treatment, and so on. It may be pertinent here again to quote Whitby (1938b):

> "The effect in gonorrhoea must also be remembered: in many cases dramatic and instant cure; in others, a recrudescence of the infection, which is then resistant to drug treatment or at least to treatment with the same drug, but which may respond to a change of compound. And I have already indicated that M & B 693 appeared to become more progressively inactive on *Streptococcus viridans*. This is highly suggestive that resistant or insensitive individuals may be developed. It gives a hint for the clinical field—that is, that if the first course of a drug is not completely successful it might be as well to use a different drug for a second course."

The great bulk of cases may be cured by a total dosage of from 15 to 20 grammes. The majority may also be cured within a week. It is probably advisable to avoid anything less than 3 grammes daily as the initial dosage in treatment. In initial amounts above this, in degrees short of undesirable toxicity, it may yet be established that the higher the initial dose the speedier may be the cure, the greater the proportion of cures, and, notwithstanding a high incidence of minor toxic reactions for a short period, the greater may be the immunity from major or serious reactions. Though female cases are not included in this report, for reasons already stated, mention may be made of the fact that, as a rule, they are less tolerant than men to M & B 693. Children, on the other hand, appear, with comparative doses, to have the greatest tolerance of all.

For how long one should persist in the presence of positive bacteriological findings is a difficult matter to decide. The suggestion is made that if a patient does not become gonococcus-negative by the end of a week, particularly if his dosage has been fairly high, or if he relapses more than once, a change to some other member of the sulphonamide group should be considered. It is doubtful if even a return to M & B 693 after some time is advisable.

One great point to be remembered is that the cessation or the apparent cessation of discharge is not necessarily synonymous with cure. Those who are not prepared to follow up their patients to a reasonable estimation of cure should note this: an optimistic patient may be excused for believing that the disappearance of his discharge means cure, but his doctor should not also be tricked into the same blunder, for even M & B 693 is not infallible. Whatever the apparent results are, care should be taken, by adequate investigation and observation, to ensure that cure has really been effected. The very efficacy of a drug like M & B 693 may prove to be not altogether an unmixed blessing, in that it may incite a high defaulting rate among patients. The high incidence of cure may lead some to assume such a state of affairs too readily, and to neglect corroboration of the assumption. It appears to be advisable to evolve a reasonably efficient estimation of cure without prolonging tests unnecessarily—especially to a degree where the patient, if he does not default, now attends with his tongue in his cheek, in the meantime having reverted to his former sexual activities.

A most important aspect of M & B 693 is its efficiency in preventing what makes gonorrhoea a serious disease—the development of complications. As already mentioned, apart from two cases among the six which did not respond to the drug, not a single complication developed in our series. This highly protective action must surely be one of the most potent of all arguments concerning the relative values of early and late treatment.

Summary

Treatment of a series of 127 cases of gonorrhoea in the male by M & B 693 is described.

The standard of cure insisted upon is detailed.

Thirty patients in this series ceased to attend, or were transferred to other centres, before final tests of cure could be carried out. Of the remaining ninety-seven there were ninety-one patients who passed all tests of cure—which gives over 93 per cent. of successful results. There were six failures.

Of those ceasing attendance, eight were probably cured, seventeen were doubtful, and five transferred.

Toxic reactions encountered were of the minor type, varying in incidence with the dosage employed. These reactions subsided rapidly on withdrawal of the drug, and no major toxic effects have developed.

Various dosage schemes have been tried, and it is suggested that intensive treatment over a short period merits further investigation.

Treatment should be instituted at the earliest possible moment, particularly in view of the noteworthy absence of complications in cases so treated.

In face of failure to respond within a week, or of early relapse, persistence with M & B 693, even in repeated courses, has proved ineffective. In the interests of the patient, in such circumstances, resort should be made to some other form of therapy.

In our experience M & B 693 has proved the most effective therapeutic agent yet introduced in the treatment of gonorrhoea.

We wish to thank Dr. John Smith, director of the City Hospital Laboratory, Aberdeen, for his co-operation in this investigation. We desire also to express our thanks to Pharmaceutical Specialities (May & Baker) Ltd. for generous supplies of M & B 693 over the trial period of this study.

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SULPHANILAMIDE IN THE TREATMENT OF MEASLES*

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There is now a considerable literature regarding the value of sulphanilamide in the prevention and treatment of certain streptococcal infections. The investigation of its value in the treatment of measles, in which many of the complications are of streptococcal origin, is therefore important, and such an investigation was carried out during the 1937–8 epidemic in Glasgow. A ward in Ruchill Hospital was allocated for the purpose, and this report is based on the cases admitted to that ward between December, 1937, and March, 1938. There was no selection of patients, the ward taking its normal part in the reception of such cases of measles as were admitted to hospital. The material may therefore be regarded as representative of the disease in this district during the period reviewed. There is, of course, some selection of cases outside of hospital, so that a high proportion of complicated cases is admitted. The patients were under my own control throughout.

Plan of Investigation

The cases were allocated, in order of admission, alternately, to two groups. The first, or control group, received the usual nursing and expectant medical treatment; the second group received in addition sulphanilamide (para-aminobenzenesulphonamide). The dosage of the drug was varied with the age of the patient: under 5 years, 0.25 gramme was administered at four-hourly intervals for a period of ten days, followed by 0.25 gramme thrice daily until dismissal; those over 5 years received 0.5 gramme at the same intervals and for a like period. (This dosage was similar to that which had been used with benefit in cases of erysipelas. While no serious ill effects were noted from the use of the drug, five cases showed moderate cyanosis and one case drug fever.) Apart from this the two groups received strictly comparable treatment. All cases were given on admission 4,000 units of diphtheria antitoxin as a prophylactic procedure. The control group numbered sixty-two, and those treated with sulphanilamide sixty-three, a total of 125 cases. The additional case in the treated group is explained by the removal from the control group of a case in which the diagnosis of measles was not confirmed.

Method of Assessment

Each case was examined on admission and a note made of the presence of any complication. It was decided that information regarding the value of the drug would be best obtained by comparing the two groups with respect to the following criteria: (i) the duration, in days, of primary pyrexia; (ii) the duration, in days, till clinical cure of complications noted on admission; (iii) the incidence and nature of complications arising in hospital; (iv) the duration, in days, till clinical cure of complications arising in hospital; (v) the duration, in days, of residence in hospital. All cases were therefore reviewed and examined daily and notes were made of their progress, with special reference to the above points. For the purpose of the experiment the day on which the rash appeared was regarded as the first day of the disease.

Before recording the results it is necessary to compare the two groups with respect to factors which might influence them. The most important of these are: (1) the age and sex distribution, (2) the duration of the disease before admission to hospital, and (3) the incidence of complications noted on admission. Tables I, II, and III show that the two groups were fairly evenly balanced in these respects, except that the cases receiving sulphanilamide treatment showed a slightly higher incidence of complications on admission.

Measles

TABLE I.—*Age and Sex Distribution*

Age Group (Years)	Control Group		Sulphanilamide Group	
	Males	Females	Males	Females
0–1	4	5	8	7
1–2	13	9	9	8
2–3	7	4	8	2
3–4	2	3	5	4
4–5	3	4	2	1
Over 5	1	7	3	6
Totals ..	30	32	35	28

TABLE II.—*Duration of Illness (in Days) before Admission*

Days:	0	1	2	3	4	5	6	7	8–14	Over 14
Control Group	3	12	7	9	3	8	4	4	9	3
Sulphanilamide Group ..	7	11	12	5	6	4	4	3	9	2

* A report to the Therapeutic Trials Committee of the Medical Research Council.

TABLE III.—*Complications Present on Admission*

	Control Group	Sulphanilamide Group
Conjunctivitis	29	29
Blepharitis	3	3
Otitis media	3	3
Rhinitis	19	31
Tonsillitis	1	2
Stomatitis	0	4
Laryngitis	2	3
Bronchitis	43	42
Bronchopneumonia	13	16
Empyema (pneumococcus Group IV)	0	1
Resolving pneumonia	1	0
Gastro-enteritis	13	12
Cervical adenitis	0	3
Burn of skin	1	1
Impetigo	1	2
Totals	129	152

Results of Treatment

TABLE IV.—*Duration (in Days) of Primary Pyrexia*

Days:	0	1	2	3	4	5	6	7	8–14	Over 14	Mean Duration
Control Group	9	11	11	11	2	4	4	1	6	3	3.92
Sulphanilamide Group	8	14	13	7	7	4	3	1	5	1	3.43

Table IV indicates that sulphanilamide has little effect in shortening the febrile period after admission to hospital. There is a slight reduction in the mean duration in the sulphanilamide-treated cases.

DURATION OF COMPLICATIONS NOTED ON ADMISSION

Table V shows the maximum, minimum, and average duration, in days, of some of the principal complications.

TABLE V

	Control Group Duration in Days			Sulphanilamide Group Duration in Days		
	Maximum	Minimum	Average	Maximum	Minimum	Average
Conjunctivitis	11	1	3.5	8	1	3.7
Otitis media	82	22	42.0	25	6	14.0
Rhinitis	10	1	4.1	12	1	6.0
Bronchitis	30	2	6.8	11	2	6.0
Bronchopneumonia	24	3	13.2	16	3	8.3
Gastro-enteritis	11	1	5.0	20	3	6.4

These figures do not suggest that sulphanilamide is of great value in hastening the cure of the major complications of measles. In the case of otitis media, the numbers (three in each group) are too small to admit of comparison. The duration of bronchopneumonia, however, is materially less in those cases which received sulphanilamide treatment. The figures have been analysed statistically, and the difference is regarded as significant.

COMPLICATIONS ARISING IN HOSPITAL

In the control group thirty cases developed a total of forty-seven complications, while in the sulphanilamide group twenty-two cases developed twenty-three complications (Table VI). It must be remembered that the cases receiving sulphanilamide had a higher proportion of complications on admission, and might therefore be expected to develop fewer complications in hospital. But in the control group there were fifteen cases of those complications usually associated with streptococcal infection (tonsillitis and adenitis, and otitis media), while in the sulphanilamide-treated group only three such cases were noted. A χ^2 test has been applied to these figures, and the difference is regarded as significant ($P = 0.01$).

TABLE VI

	Control Group	Sulphanilamide Group
Otitis media	7	3
Otitis externa	—	1
Rhinitis	3	1
Tonsillitis and adenitis	8	—
Laryngitis	—	1
Bronchitis	3	1
Bronchopneumonia	3	3
Sterile pleural effusion	1	—
Empyema (pneumococcus Group IV)	—	1
Gastro-enteritis	12	5
Acute dermatitis	2	2
Subcutaneous abscesses (*Staphylococcus aureus*)	2	—
Paronychia	2	1
Hordeolum	4	3
Furuncle	—	1

With regard to the duration of these complications, however, no material difference was noted between the two groups, except in the case of otitis media, the averages here being: control group, 13 days; sulphanilamide group, 6.3 days.

DURATION OF STAY IN HOSPITAL

Table VII shows the residence in hospital of the two groups. The average in the control group was 26.5 days; in the sulphanilamide group, 25.6 days. No beneficial effect from the use of sulphanilamide was noted.

TABLE VII

Days:	Under 14	15–21	22–28	29–35	36–42	Over 42
Control Group	3(a)	27	16	4	4	8
Sulphanilamide Group	2(b)	35	17(c)	4	2	3

(a) One death. (b) Two deaths. (c) One death.

Four deaths occurred in the series (3.2 per cent.)—one in the control group and three in the sulphanilamide group.

Discussion

The series is a small one, and conclusions must be drawn with caution. It is felt, however, that the following factors are of importance in evaluating the results.

(*a*) All cases were under the clinical care of one person. Individual variations in assessment or diagnosis are thus overcome.

(*b*) All cases were treated in the same open-type ward under the supervision of the same sister and nursing staff. Differences in nursing technique therefore do not arise. Again, the practice in some hospitals of segregating severely complicated cases into certain wards may make combined figures difficult to assess. The work of Okell and Elliott (1936) and Allison and Brown (1937) with regard to the epidemiology of strepto-

coccal infections in open wards indicates that the accumulation of figures from different wards might give rise to fallacies—for example, due to differences of bed-spacing, incidence of infective cases, etc.—for which it would be difficult to make allowance.

(c) Finally, the two groups were evenly balanced in respect of such factors as age, sex, and duration of illness before admission. The incidence of complications noted on admission was greater in those cases receiving sulphanilamide.

The figures suggest that sulphanilamide is of some value in shortening the duration of bronchopneumonia, but that it has little effect upon the course of the other main complications of measles, with the possible exception of otitis media (see below).

Certain complications—namely, those usually associated with streptococcal infection—were of less frequent occurrence during the period in hospital in the cases receiving sulphanilamide. With regard to otitis media, it may be noted that there was in the control group a total of ten cases with an average duration of 21.7 days; while in the cases receiving sulphanilamide there was a total of six cases with an average duration of 10.1 days. These differences suggest a therapeutic benefit, and indicate that sulphanilamide has a place in the treatment of measles cases in open-type hospital wards. The complications prevented are largely those which might arise from ward "cross-infection."

Summary

A series of 125 cases of measles admitted to hospital between December, 1937, and March, 1938, was investigated to determine the value of sulphanilamide in treatment.

The cases were divided into two groups without selection, one group being treated with sulphanilamide, the other acting as controls.

Comparison is made between the two groups with respect to complications before and after admission, and length of stay in hospital.

The conclusions to be drawn from the survey are given.

I have to thank Dr. W. M. Elliott, physician-superintendent, Ruchill Fever Hospital, for permission to carry out the investigation. I am indebted to Dr. P. L. McKinlay, Department of Health for Scotland, who was kind enough to read the paper and carry out the statistical analyses.

The preparation of sulphanilamide used in these tests was "sulphonamide-P," of which supplies were generously placed at my disposal by Messrs. Burroughs Wellcome and Co. through the Therapeutic Trials Committee of the Medical Research Council.

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The annual report for 1938 of the British Red Cross Society Clinic for Rheumatism states that the financial position of this institution has not improved and that the year's working shows a considerable deficit. There were 88,671 attendances with 135,760 treatments in the general department; 7,881 attendances and 10,698 treatments in the private patients' department. It is gratifying to note the attendance of a greater proportion of patients suffering from the earlier manifestations of rheumatism, although the number of advanced cases, for whom treatments must necessarily be palliative and prolonged, is still all too large. Close collaboration is maintained with the various specialist departments. The pathologist carried out 1,756 examinations; 1,695 patients were radiographed; seventy-eight patients, several of whom were found to require operative treatment, were referred to the gynaecologist and sixty-six to the dental department. Investigations are proceeding on the relation between pathological dental conditions and rheumatism.

PARA-BENZYLAMINOBENZENESULPHONAMIDE IN THE PREVENTION OF MEASLES COMPLICATIONS

BY

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Although the causal virus of measles may rarely be responsible for death in the very early stage of the disease, much the greater part of the mortality is due to complications, the most fatal being bronchopneumonia (Parsons and Barling, 1933; Stimson, 1936; Ellison, 1931). Besides having a high mortality the complications of measles may seriously curtail health and capacity in later life by leaving grave sequelae such as lung fibrosis and chronic middle-ear disease. The bacteriology of the complications of measles has received much study and, while it is recognized that a general inflammation of mucous membranes is associated with the viral phase of the disease, it is accepted that complications are due to the invasion of this suitably prepared soil by a secondary organism, of which much the most common is the haemolytic streptococcus (Okell and Elliott, 1936; Williams, 1935; Layton, 1937; Keevil and Camps, 1937; Allison and Gunn, 1932; Banks, 1938). Occurring with much less frequency are the pneumococcus and *Haemophilus influenzae*. In addition the convalescent measles patient is susceptible in varying degree to secondary diseases such as diphtheria, scarlet fever, Sonne dysentery, and other enteral infections of childhood. Attempts to control the invading power of the haemolytic streptococcus in measles by anti-streptococcal serum having been quite unsuccessful, an adequately controlled experiment with chemotherapy was clearly indicated. A suitable opportunity arose during the winter of 1937–8, when measles assumed epidemic proportions in London.

The prontosil derivative which I decided to use was para-benzylaminobenzenesulphonamide (proseptasine). Although my experience with this preparation in the treatment of scarlet fever had been disappointing (Hogarth, 1937), I was now quite convinced, from results obtained in erysipelas and other streptococcal diseases, that this derivative is active against most strains of haemolytic streptococci. Another important point in favour of proseptasine, as judged from my previous experience, was its comparative lack of toxicity—a matter of some moment when dealing with young children, many of whom might be extremely ill.

The Present Investigation

It has been the practice for some time at this hospital to administer a combined prophylactic injection of scarlet fever and diphtheria antitoxin to all measles cases on admission. This procedure has amply justified itself in a sharp reduction in the incidence of scarlet fever in measles wards and in the virtual disappearance of the serious and occasionally lethal attacks of diphtheria to which the measles patient is particularly prone. All the cases in the present investigation received passive immunization in this way.

Classification of Severity.—The 329 cases of measles which formed the subject of this investigation were graded according to severity on admission. All received the usual routine treatment such as fresh air and simple drugs when indicated, in addition to the prophylactic dose of antitoxin described above. Approximately half of these cases received para-benzylaminobenzenesulphonamide in

accordance with a fixed scheme of dosage. Classification is never entirely satisfactory in measles, as there is no single sign or biological test on which an accurate assessment of severity may be based. However, a simple grouping into mild, moderate, and severe cases was evolved, which took into account such factors as toxaemia, intensity of rash, condition of the mouth, etc. In order to avoid any grave error in future comparison between the treated and control cases respectively, all the assessment of severity was done by myself and on the day of admission.

Assessment of Complications

While I acknowledged that there are many more complications in measles than those specifically mentioned, these others occur so infrequently as to be unimportant for the purpose of this investigation. As the personal element also enters into the definition of the various complications, I include the following details.

Acute Bronchitis.—This is an almost constant concomitant of the early stage of measles and, as such, is part of the disease rather than a complication. In a few cases the persistence of physical signs does justify its inclusion as a definite complication; but the dividing line is not sharp, and in view of the grave doubt that might exist in individual cases the respiratory complications accounted in this investigation were those in which the inflammatory process had spread to the lung substance.

Bronchopneumonia.—This condition was taken to be present only when there was radiological and/or clinical evidence of consolidation of lung tissue, together with the other typical signs of bronchopneumonia.

Acute Otitis Media.—This was diagnosed when the drumhead was found to be inflamed or when the ear discharged. Actually all those noted to be inflamed subsequently developed ear discharge. Indeed, in the majority of cases the presence of discharge was the first indication of trouble, as is so often the case in children.

Enteritis.—A definition of enteritis is difficult, since the term may include a number of non-specific enteral infections of widely different aetiology. I recognize, too, that certain enteral infections are possibly not complications of measles in a strict sense, but are more correctly secondary diseases. However, since no more precise classification is available, enteritis was considered to be present when there was diarrhoea with or without vomiting, green stools, and evidence of dehydration, and where, after repeated cultural examination, no pathogenic organism was recoverable from the faeces. Minor dyspeptic disturbances and enteral infections of known aetiology such as dysentery (Sonne) are excluded.

Adenitis.—This term is restricted to the cases in which there was definite swelling and tenderness of the lymph nodes, commonly in the neck, accompanied by pyrexia.

Finally, it should be emphasized that I was concerned only with the preventive value of proseptasine, and, since the administration of the drug was limited to a period of ten days, only those complications which appeared within twelve days after admission to hospital have been taken into account.

Dosage and Administration of Proseptasine

In order to avoid the known dangers of prolonged dosage administration was limited to a period of ten days, over which the drug was given in full doses for five days and subsequently in half-doses. However, children under 1 year of age, who normally tolerate the drug well, were given two-thirds of the full dose over the second period of five days. The details of dosage are as follows. Patients under 1 year of age received 0.5 gramme three times daily for five days, then 0.5 gramme twice daily for five days; those from 1 to 5 years old, 1 gramme three times daily for five days, then 0.5 gramme three times daily for five days; and those 5 years old and upwards, 1 gramme four times daily for five days, then 0.5 gramme four times daily for five days. Little or no difficulty was experienced in administering the drug, the younger children taking it well when it was crushed up in milk or glucose lemonade. No unpleasant reaction occurred in spite of the relatively large doses employed. This bears out my original impression when I used proseptasine in scarlet fever, and is supported by the results of Whitby's experiments (Hogarth, 1937; Whitby, 1938).

Results

The 329 cases of measles occurring within the same epidemic period, from December, 1937, to July, 1938, were divided into a treated and a control series—children of approximately the same degree of severity being placed alternately in the two groups. Table I has been compiled

TABLE I.—*Showing Distribution of Cases according to Age and Severity of Disease*

Age Groups		Control Series			Proseptasine Cases			
		Mild	Moderate	Severe	Mild	Moderate	Severe	Total
0–1 year	(*a*)	13	11	1	7	8	1	41
	(*b*)	1	1	0	1	4	1	8
1–2 years	(*a*)	24	23	4	24	15	3	93
	(*b*)	3	4	1	4	1	0	13
2–4 „	(*a*)	25	24	3	25	28	4	109
	(*b*)	3	2	0	2	2	0	9
3+ „	(*a*)	21	20	1	20	21	3	86
	(*b*)	1	2	1	0	0	0	4

(*a*) is the actual number; (*b*) the number with complications.

to show the distribution of the treated and control series according to age and severity of disease. It will be seen that the distribution, so far as severity on admission is concerned, is slightly less favourable for the treated series than for the controls, whereas the reverse is the case with regard to the age distribution—the control series having a somewhat higher percentage of cases in the younger age groups. In all, the differences are slight, and are not thought to preclude direct comparison between the treated and control groups. This has been done in Table II. Certain facts emerge from a study of this table which indicate that proseptasine has some influence on the incidence of the four commonest complications of measles. Thus the total complication rate in the control series was 15.3 per cent., as against 10.0 per cent. among cases which received prophylactic treatment with proseptasine. Closer scrutiny reveals that the results were not equally good with all complications, the incidence of enteritis apparently being quite unaffected by the drug. With regard to the other complications, it is reasonable to infer that proseptasine has prophylactic value, as the incidence of bronchopneumonia, acute otitis media, and cervical adenitis is less than that of the controls. Thompson and Greenfield (1938), using other preparations of sulphanilamide, have already suggested that this may be so.

Discussion of Individual Complications

Bronchopneumonia.—In hospital practice bronchopneumonia occurs twice as often before admission as after. However, the incidence rate of bronchopneumonia in the control series was about twice that of the cases treated

TABLE II.—*Showing Details of Certain Complications arising after Admission, Numbers and Percentage, in Control and Proseptasine Series*

Age	Control Series						Proseptasine Series					
	Cases	Broncho-pneumonia	Acute Otitis Media	Acute Enteritis	Cervical Adenitis	All Complications	Cases	Broncho-pneumonia	Acute Otitis Media	Acute Enteritis	Cervical Adenitis	All Complications
0–1 year	25	0	0	2 (8)	0	2 (8)	16	1 (6.2)	2 (12.5)	4 (25)	0	7 (43.7)
1–2 years	51	2 (3.9)	7 (13.7)	1 (1.9)	1 (1.9)	11 (21.6)	42	1 (2.4)	0	4 (9.6)	1 (2.4)	6 (14.3)
2–4 ,, ...	52	1 (1.9)	3 (5.7)	2 (3.8)	0	6 (11.4)	57	0	3 (5.1)	0	0	3 (5.1)
4+ ,, ...	42	2 (4.8)	2 (4.8)	2 (4.8)	1 (2.4)	7 (16.6)	44	0	0	0	0	0
Totals	170	5 (2.9)	12 (7)	7 (4.1)	2 (1.2)	26 (15.3)	159	2 (1.3)	5 (3.1)	8 (5)	1 (0.6)	16 (10)

with proseptasine. This result may not be wholly due to the action of the drug on the haemolytic streptococcus, since other organisms, such as the pneumococcus, play a part. Evidence so far, however, has not shown that proseptasine has any action on the pneumococcus other than Type III (Whitby, 1938).

Acute Otitis Media.—In addition to being the commonest complication of measles, acute otitis media occurs four times as often after admission as before admission to hospital. The general hospital rate during the epidemic was 9.33 per cent. This compares very unfavourably with the 3.1 per cent. incidence of the treated group, and suggests that proseptasine has a prophylactic value in this complication. Further, it will be noticed that the incidence of otitis media in the control series (7.0 per cent.) is less than that for the measles cases generally, and confirms a clinical impression that the wards in which chemotherapy was employed had relatively fewer otorrhoea cases even among the controls. The explanation of this lies in the fact that gross extraneous sources of streptococcal infection such as otorrhoea constitute a risk to other patients in the ward, and that a diminution in this "reservoir of infection," as occurred in the proportion of cases treated with proseptasine, leads to a decrease in the incidence of otorrhoea among other cases in the ward (Harries, 1935). Incidentally, it should be mentioned that haemolytic streptococci were recovered, and sometimes in pure culture, from every case of otorrhoea in the present investigation.

Cervical Adenitis.—Relative to the complications described, cervical adenitis is unimportant in measles; but it is an expression of streptococcal activity, and although the numbers here are perhaps too small to justify comparison they suggest that proseptasine did exert a favourable influence on the incidence of this complication.

Enteritis.—This is a complication of measles the importance of which cannot be measured by the numbers in which it occurs. Although its incidence is one-third of that of otitis media, it is second only to bronchopneumonia as a cause of death in measles. In all probability widely varying organismal groups are concerned in this complication, but no evidence has been adduced to incriminate the haemolytic streptococcus. Whatever the aetiology, the occurrence of non-specific forms of enteritis in measles does not appear to be influenced in the slightest by the administration of proseptasine.

Other Complications.—Tonsillitis, conjunctivitis, boils, and styes occurred among treated and control cases, but in insufficient numbers to justify comparison. It may be significant, however, that in a small ward outbreak of Sonne dysentery three controls were attacked but the treated cases escaped.

Summary

In an attempt to assess the value of proseptasine in preventing the complications of measles a controlled investigation has been carried out on 329 cases of measles, 158 of which received proseptasine for a period of ten days after admission to hospital.

While, owing to the mildness of the epidemic, the incidence of complications generally was lower than is usual, there is evidence that proseptasine is of value in reducing the incidence of complications due wholly or in part to secondary invasion by haemolytic streptococci, the best results being obtained in pure streptococcal complications such as otitis media.

Proseptasine does not appear to influence the incidence of non-specific enteritis in measles.

The comparative lack of toxicity of proseptasine, even when administered to very young children, has been fully borne out.

I desire to thank Dr. N. D. Begg, superintendent of the Eastern Hospital, for his criticism and help in the carrying out of this investigation.

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Applications are invited by the Council of the Royal Society for the Alan Johnston and Lawrence Research Fellowship in the Medical Sciences, tenable in any hospital or medical school in the British Isles. Candidates should supply the usual personal details and give the names of two referees. Testimonials will not be considered. Applicants and referees at a distance may write direct to the address given below without first obtaining forms. The subject of the proposed research and the place at which it would be carried out, together with the name of the head of the department, should be given. The appointment will be for two years in the first instance, from October 1, 1939, and will be renewable up to a maximum of five years. It will be subject to the conditions governing Royal Society research appointments. The stipend is £500 per annum, with superannuation benefits. Applications should be made on forms to be obtained from the assistant secretary, the Royal Society, Burlington House, London, W.1, and should be received not later than May 31, 1939.

SEVERE EPISTAXIS, DIFFICULT TO CONTROL

BY

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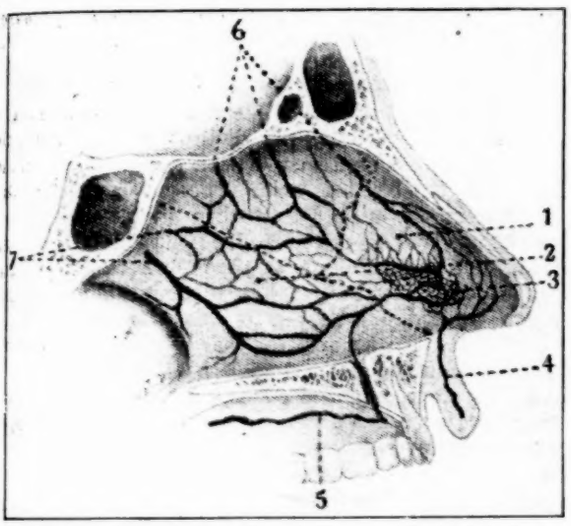
Simple epistaxis arising from an abraded or leaking capillary of the septum is a common occurrence, and is sealed easily by the galvano-cautery. Ninety per cent. of cases of epistaxis probably arise from this source. If the accompanying drawing of the nasal blood supply is



Sagittal section of nose, showing the arteries on the right side of the septum. 1: Quadrilateral cartilage. 2: The vomer. 3: The locus Kiesselbachii, or vascular area. 4: Septal branch of the superior coronary artery. 5: Palatine branch. 6: Ethmoidal branches of the ophthalmic artery. 7: Spheno-palatine artery from the internal maxillary artery.

(*Diseases of the Nose and Throat*, by Sir StClair Thomson and V. E. Negus. Published by Messrs. Cassell and Co., Ltd.)

studied, it will be seen that the upper part of the nose in the olfactory cleft is supplied by the anterior and posterior ethmoidal arteries arising in the orbit from the ophthalmic artery, a branch of the internal carotid artery. The lower and greater part of the nasal septum is supplied by the naso-palatine artery given off by the spheno-palatine artery, a branch of the internal maxillary artery of the external carotid. The naso-palatine artery branches off at the spheno-palatine foramen, and crosses the cavity of the nose on the under surface of the floor of the sphenoidal air sinus. This artery forms a network of capillaries to anastomose with the septal branch of the superior coronary, lying on the lower edge of the septum just within the nostril. Other branches of the spheno-palatine artery pass to the inferior turbinal and lower edge of the middle turbinal. It will be seen that the upper part of the nose is supplied by the internal carotid, and the lower part of the nose by the external carotid—a point to be remembered if a large main artery has to be ligatured to arrest copious haemorrhage. The mechanism controlling the volume of blood circulating in the nose is very sensitive. It responds quickly to changes of temperature, changes in the position of the head, to exertion both physical and mental, and also to emotion. Any of these factors may convert a slight epistaxis into a profuse haemorrhage. Therefore, patients suffering from severe epistaxis should be kept at rest in an equable temperature and in a sitting position. The difficult cases are: (1) epistaxis due to injuries to the head or nose; (2) epistaxis of unknown origin in old people; (3) epistaxis due to disorders of the blood, such as severe anaemia, leukaemia, etc.; (4) epistaxis due to hereditary multiple telangiectasis.

Epistaxis due to Head or Nose Injuries

Epistaxis arising from injuries to the head or nose, though common, often stops spontaneously, but there are cases in which even plugging and other methods may fail. A trivial injury such as a blow on the back of the head, or more severe injuries such as fracture of the nasal bones or fracture of the skull, may result in copious haemorrhage often difficult to control. Such haemorrhage arises from the roof of the nose in the olfactory cleft, and in a position difficult to plug efficiently. The following is an example of such an injury.

A healthy youth of 17 received at midday a blow on the nose from a fist, which fractured the nasal bone and nasal process of the maxilla. Haemorrhage was so copious that plugging failed to arrest it, and in spite of blood transfusions he died the same night from haemorrhage. At the post-mortem examination it was found that the anterior ethmoidal artery had been ruptured. If a diagnosis of the source of the bleeding could have been made, ligature of the ethmoidal arteries would have saved his life. This operation is done by making an incision along the inner third of the supra-orbital margin to below the inner canthus of the eye to expose the roof and inner wall of the orbit, and with patience the artery can be picked up without difficulty.

Fissured fractures of the anterior fossa of the skull involving the roof of the nose, with the loss of sense of smell, are common, and still more common in the roof of the orbit with the classical subconjunctival haemorrhage. The ethmoidal arteries have a short intracranial course across the roof of the nose, where they are easily ruptured. A fracture of the middle fossa, in which the fracture takes the line of the anterior edge of the petrous bone across the sphenoidal air sinus, may open the cavernous sinus or internal carotid artery. Such an injury means almost immediate death from haemorrhage, but a number of cases of arteriovenous or orbital aneurysm of the cavernous sinus and internal carotid have been recorded in which the patients have survived. The sphenoid air sinus is opened in about 70 per cent. of fractures of the middle fossa of the skull.

The following case, with copious epistaxis, may be quoted.

A soldier was admitted to hospital on July 10, 1938, after a motor-cycle accident; he was unconscious for forty-eight hours. There was a haematoma of the right eye, and laceration of the scalp in the right temporal region. He was discharged on August 19, with blindness and optic atrophy of the right eye. There was no paresis of the cranial nerves. On October 4 copious right epistaxis occurred. On November 2 he was admitted to another hospital with epistaxis. The blood pressure was then 150/100, and the haemoglobin 50 per cent. *X*-ray examination was negative. The blood-clotting time was five minutes. On November 5 epistaxis again occurred, and on December 21 the sight of the left eye was lost. There was epistaxis at six-day intervals, and the haemoglobin went down to 48 per cent. and the red cells to 2,970,000 per c.mm. On January 17, 1939, after a blood transfusion, the patient was transferred to London. No leak of cerebro-spinal fluid from the nose was observed. *X*-ray examination was negative. The patient was drowsy and complained of headache. The right eye was completely blind; the pupils were dilated and did not react to light. There was ptosis of the right upper eyelid, and complete right third cranial nerve paralysis. The fifth cranial nerve was normal. The left eye was blind. Examination of the nose showed a blood-clot on the right side and a slight ooze of watery blood from the roof. Two pints of blood were lost on

January 13. The following day the patient was seen by Professor Hugh Cairns. Aneurysmal bruit was heard with the stethoscope applied to the temporal fossa. The bruit was arrested by compression of the right common carotid artery. A diagnosis of intracranial aneurysm of the internal carotid artery was made, and Colonel Weddell and Major Hare ligatured the right common carotid artery. The patient had no further epistaxis for a few days, but later a little occurred on two occasions. The paralysis of the third cranial nerve improved and the general condition became much better. Epistaxis, though less, returned, and on February 3 the external carotid artery was ligatured. At the time of this ligature the external carotid showed no pulsation.

Incidentally, Bathe Rawlings (1904) collected twenty cases of orbital aneurysm following fractures of the skull, but he does not mention epistaxis. In twelve cases the common carotid artery was ligatured, with great improvement in the symptoms of aneurysm. Ligature of the common carotid, however, does not always control epistaxis. Repeatedly the severe haemorrhage from an epitheliomatous ulcer of the lateral wall of the nose or of the nasopharynx was not arrested by ligature of the common carotid. Cases of copious epistaxis requiring ligature of the common carotid must be very rare, and it is only when all other methods of control have failed, when life is endangered, and when there is an intracranial aneurysm of the internal carotid that ligature is considered.

Geoffrey Jefferson (1938) records a case of severe epistaxis following an operation for nasal polypi in which the haemorrhage forced the plug out of the nose. Ligature of the internal carotid in the neck immediately arrested the haemorrhage. The case was diagnosed as an intracranial aneurysm of the internal carotid, and is one of sixteen cases of this aneurysm recorded by Jefferson. There was a history of epistaxis in only one other of these sixteen cases.

Cerebrospinal rhinorrhoea, as the result of an injury in which the dura mater is torn by a fracture of the roof of the nose near the anterior or posterior ethmoidal artery, is frequently preceded by haemorrhage. In such cases packing of the nose should be avoided if possible, because the blood will be dammed up in the anterior fossa of the skull and the packing may give rise to sepsis. Meningitis is a late result of cerebrospinal rhinorrhoea, and occurs when the nose becomes infected. This haemorrhage is controlled by sitting the patient up on a Fowler bed, or one of its modifications, and giving injections of morphine and 5 c.cm. of intravenous haemostatic serum (for an adult). To safeguard against anaphylaxis a preliminary dose of 2 c.cm. of haemostatic serum is injected into the vein, and if all is well the remaining 3 c.cm. is given. Haemostatic serum is more effective when injected into a vein than when injected into a muscle. It may be necessary to ligature the ethmoidal arteries. Professor Hugh Cairns (1937) has recorded cases of cerebrospinal rhinorrhoea and their treatment by operation.

Epistaxis in Old People

In old persons epistaxis comes on spontaneously, frequently in the early morning, after sleep, or on lying down at night. Attacks of haemorrhage may recur for two or three days. A few of these patients complain of headache or fullness of the head preceding the attack, and state that the bleeding gives them considerable relief. It is difficult to find the bleeding-point, and there is usually a general ooze from multiple points on the septum. The underlying cause cannot be ascertained in the majority of these cases, but it is assumed that the condition arises from a disorder of the cardiovascular system, and is called physiological. It, however, is a source of great discomfort and anxiety to the patient, and he is never willing to allow it to continue unchecked. Such a patient is made to sit bolt upright with the nose and chin depressed. He is told to compress the nostril firmly against the septum with the finger and thumb. Then a pledget of wool soaked in a solution of 20 per cent. cocaine is placed on the septum well within the nose. Next, the narrowest ribbon gauze soaked in a 20 per cent. solution of cocaine, with an equal quantity of Parke, Davis adrephine inhalant, is packed into the nose after the removal of the pledget of wool. A 1 in 1,000 solution of adrenaline should be avoided because it produces a violent coryza in most people and a return of the haemorrhage when the plug is removed or blown out. If the gauze plug is taken away after ten minutes it may be possible to detect the bleeding-point or the area of haemorrhage. If there is a definite bleeding-point it can be sealed by the dull-red galvano-cautery, or gauze generously impregnated with ferropyrine powder packed on to the bleeding area. The gauze plug should not remain in the nose longer than twenty-four hours without being removed or replaced. If these local applications are not successful, or if there is a return of the haemorrhage, an injection of $\frac{1}{4}$ grain of morphine should be given. Indeed, this is one of the best remedies for severe epistaxis, particularly for that following an operation. An intravenous colloidal calcium injection is favoured by some, but it is not as effective as morphine. At a suitable time the patient's general condition should be thoroughly investigated, not forgetting a blood examination, a record of the blood pressure, urine, etc. Very old people cannot tolerate severe epistaxis, and some of them never seem to recover completely.

Epistaxis due to Blood Disorders

Epistaxis arising from a disorder of the blood is very troublesome; it takes the form of a general ooze from the septum and there is no actual bleeding-point. Local treatment is unsatisfactory, and better results are obtained by blood transfusions, intravenous haemostatic serum, and morphine. If, of course, a bleeding-point or a suspicious point is found, the galvano-cautery, when carefully applied, is useful. Instead of gauze plugging, a small thin rubber bag or balloon is attached to a small flexible rubber tube for inflation and is placed well within the nose. The balloon is inflated like a de Ribes bag, and the air is retained by tying the rubber tube into a knot. The rubber bag is more effective than gauze for a general ooze.

Epistaxis arising from Multiple Telangiectasis

In hereditary multiple telangiectasis there are a number of purpuric spots on the septum, which bleed furiously and frequently when abraded. The application of the galvano-cautery often fails to arrest the haemorrhage even when applied to the bleeding spot or spots. In fact, the cautery temporarily increases the haemorrhage. The best method of control is by the inflated rubber bag. Electrocoagulation, radium, and submucous resection of the septum to raise the mucosa from the septum, and scarring, have failed. G. H. O'Kane (1938) has given with success repeated submucous injections of 5 per cent. solution of quinine and urethane injected near the telangiectases. In addition to the above there are cases of epistaxis in which the cause and source of the bleeding are obscure, and it is this uncertainty which adds to the difficulty of control.

Summary

The mechanism controlling the volume of blood circulating in the nose is described, together with the factors that lead to severe epistaxis.

The difficult cases are classified into four groups, each of which is discussed separately, along with the appropriate treatment.

A typical case of copious epistaxis is quoted.

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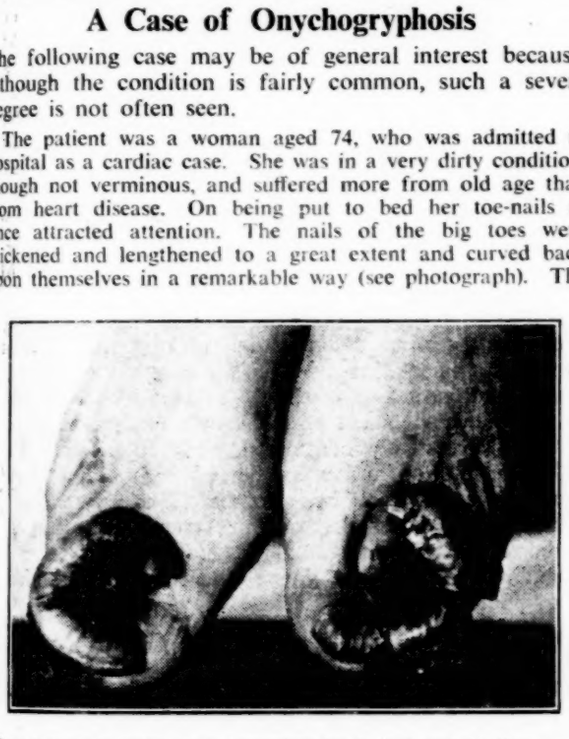
Clinical Memoranda

A Case of Onychogryphosis

The following case may be of general interest because, although the condition is fairly common, such a severe degree is not often seen.

The patient was a woman aged 74, who was admitted to hospital as a cardiac case. She was in a very dirty condition, though not verminous, and suffered more from old age than from heart disease. On being put to bed her toe-nails at once attracted attention. The nails of the big toes were thickened and lengthened to a great extent and curved back upon themselves in a remarkable way (see photograph). The



other toe-nails were also hypertrophied, but not to the same degree. The finger-nails were not deformed. There were no ulcers at the points where the nails rested on the skin, and this was apparently due to the fact that the nails were fairly mobile and did not press continuously on any one point. On the soles of the feet, over the heads of the third metatarsals, were two sore areas, presumably caused by pressure from the footwear.

When questioned about the nails the patient became shy, and, being difficult to understand at the best of times, she was unable to give us a very good history. She told us, however, that they had been big for thirty years, but that she cut them once a fortnight! She had been able to wear either boots or shoes until taking to bed a few days previously.

The question of removing the nails does not arise at present, for the patient refuses to part with them, and it was only by assuring her that I did not intend to touch them that she agreed to be photographed.

I am grateful to Dr. Williamson, medical officer of Preston Hospital, North Shields, for permission to publish the above.

J. F. BURDON, M.B., B.S.

Preston Hospital, North Shields.

Recurrent Tubal Pregnancy

The following case is, I think, of sufficient interest to warrant publication.

CASE RECORD

A married woman aged 35 was admitted into the Government Hospital for Women and Children, Madras, on September 19, 1938, complaining of swelling and pain in the lower abdomen. There was nothing of interest in her previous history. Two years before she had her first child after having been married for eight years. She then had her periods regularly for a year, but for the last twelve months they had been irregular and scanty, lasting one or two days. She was very vague about this point, and in the out-patient department had previously given a history of amenorrhoea for a year. With the menstrual changes she had also been having slight and continuous pain in her lower abdomen, and had noticed a swelling in the abdomen which had gradually increased in size. Ten days before admission the abdominal pain became more severe, and she had, too, pain in the chest. There had also been a slight, reddish, watery, vaginal discharge.

Examination at the time of admission revealed a pale and ill-nourished woman with a pulse rate of 90 and a normal temperature. The haemoglobin content of her blood was 35 per cent.; the urine showed no abnormality. Abdominal examination disclosed a tumour movable from side to side, irregular in outline, large and cystic on the right side, and hard, nodular, and small in size on the left side. It extended up to the umbilicus and was not tender. Vaginal examination revealed that the tumour moved with the cervix. She was thought to be a case of fibroids of the uterus, and laparotomy was undertaken on September 26, 1938, after her haemoglobin content had risen to 65 per cent.

Her abdomen was opened by a suprapubic incision, under spinal anaesthesia, by Lieutenant-Colonel C. M. Plumptre. The body of the uterus was enlarged to twelve-weeks size and was displaced to the left by what was apparently a broad-ligament cyst on the right side, with no evidence of tube or ovary. This cyst was closely adherent to the body of the uterus. While trying to separate the cyst from the uterus a live foetus of about six-months size escaped. The placenta was completely within the broad ligament. There was no evidence of the left tube; the left ovary was normal and adherent to one end of a lithopaedion, the size of a small pear, attached to the broad ligament by a small pedicle and to the great omentum. Subtotal hysterectomy was done leaving the left ovary behind. The placenta was removed entire, along with the broad ligament; the abdomen was closed in layers.

Afterwards the specimens obtained at operation were examined. The uterus corresponded in size to a three-months pregnancy; the endometrium was thick and easily separated from the body of the uterus. The foetus, of six-months size, was attached by the umbilical cord to the placenta contained in the right broad ligament. The lithopaedion was about the size of a foetus of three to four months. Pathological examination of a piece of soft tissue attached to the lithopaedion showed the remains of the Fallopian tube. The patient's immediate post-operative condition was satisfactory, except for some fever for two days; later she was discharged cured.

My grateful thanks are due to Lieutenant-Colonel C. M. Plumptre, I.M.S., for allowing me to report the case, and to the superintendent of the Government Hospital for Women and Children, Madras, for permission to use the hospital records.

R. G. KRISHNAN, F.R.C.S.I.,
L.R.C.P.Lond., M.R.C.S.Eng.

Madras

Reviews

RADIOLOGICAL DIAGNOSIS

Outline of Roentgen Diagnosis. An Orientation in the Basic Principles of Diagnosis by the Roentgen Method. By Leo G. Rigler, M.D., B.S. Atlas edition. (Pp. 212; 227 figures. 30s. net.) London: J. B. Lippincott. 1938.

Dr. Rigler, who is professor of radiology at the University of Minnesota and is accustomed to supplying his students with a précis of each lecture, has been persuaded to amplify and publish these notes in a more permanent form. This part of the book is excellent, displaying a profound knowledge of the subject and forming thus a very useful descriptive diagnostic work. None of the details of producing *x*-rays and making radiographs are mentioned. The author begins with the interpretation of the film obtained and the possible fallacies and traps for the uninitiated, proceeding to short descriptions of the pathological appearances and the differential diagnosis. A short paragraph at the end of each section gives a summary of what may be expected from *x*-ray examination of an organ or part, and how this contributes to an understanding of the patient's complaint. It is in the accompanying illustrations that there is a breakdown; partly because their small size makes the detail difficult to decipher, partly because in each process of reproduction from the original negative, printing, processing, and mass production some of the fine points are lost, so that the finished book illustration leaves much to be desired. The author points out that in his course of demonstrations to students he uses upwards of fifteen hundred picked radiographs, and in his book the pictures fall far short in number and clarity. Further, for those who are not accustomed to see constantly the variations, a series of normals and the variety within physiological limits is of more importance.

Dr. Rigler's book gives a good selection of characteristic appearances, but it is difficult to see to whom the book is addressed except those who have already attended his lectures. Skilled radiologists will know what is there, or more. There are already available for reference excellently illustrated monographs on each of the systems of the body. An exception must be made in favour of the remarkable little diagrams showing the application of contrast material in taking *x*-ray photographs of so many of the tubes and cavities of the body, and the most successful semi-diagrammatic illustrations of normal and pathological bones.

CHEMOTHERAPY

Recent Advances in Chemotherapy. By G. M. Findlay, C.B.E., M.D., D.Sc. With a Foreword by C. M. Wenyon, C.M.G., C.B.E., M.B., B.S., F.R.S. Second edition. (Pp. 523. 21s.) London: J. and A. Churchill. 1939.

Chemotherapie: Ergebnisse, Probleme und Arbeitsmethoden. By Dr. Manfred Oesterlin. (Pp. 359; 39 figures. RM. 20; bound, RM. 22.50.) Braunschweig: Friedrich Vieweg. 1939.

The remarkable developments of the past four years have rendered Dr. G. M. Findlay's task in producing a second edition of *Recent Advances in Chemotherapy* both imperatively necessary and unusually formidable. The chemotherapy of bacterial infections, formerly a subject of little more than academic interest, now occupies about a third of the whole book. We believe this to be the first full and considered survey of the subject to appear in a work of established purpose and value. Whether it will long remain useful depends on the pace of future progress, but as matters stand at present it is an admirable account of all that has followed the discovery of prontosil, so arranged as to permit of easy reference to any aspect of the subject, whether chemical, experimental, or clinical. The seeker after deeper knowledge will find much of interest in the section on the many newer sulphonamide compounds, where an attempt is made to relate chemical structure with therapeutic activity; more immediately practical purposes are well served by the impartial review of therapeutic results so far reported in infections by each of a large number of different bacteria. The early part of the book deals as before with chemotherapy in parasitic and protozoal diseases, and in syphilis, tuberculosis, and leprosy. A large amount of newly acquired knowledge has been accumulated and put together here, but it seems to need a little more digestion for the reader's benefit; thus over twenty remedies for amoebic dysentery are described, but they are not so compared as to give a clear idea of their relative value or of their possibly varying degrees of usefulness at different stages of the disease. Here and in other chapters a judicial statement of general conclusions would be very helpful, particularly to those seeking guidance on therapeutic matters. Very full lists of references are given, not at the ends of chapters, but after each section—a system which, although it sometimes produces the effect of breaking up the text into disjointed fragments, should make for ease in consulting the authorities quoted.

Dr. Manfred Oesterlin's *Chemotherapie* is more restricted in its scope and different in purpose. An extensive introductory section describes in full the technique of animal experimentation involved in testing remedies for parasitic and protozoal diseases. Trypanosomiasis, syphilis, malaria, amoebiasis, piroplasmosis, and helminthiasis are then successively considered, with full descriptions of the constitution and properties of both old and new therapeutic agents for them. As a work of reference and a statement mainly of German achievements in this sphere this book will be found valuable. A useful feature is the concluding toxicity table, giving data for many hundreds of compounds.

TRACHOMA

The Etiology of Trachoma. By Louis A. Julianelle. (Pp. 248; 13 figures. 14s. net.) New York: Commonwealth Fund; London: Humphrey Milford, Oxford University Press. 1938.

Of all the diseases of the human body, apart from lethal diseases, there is perhaps none that leads to more wastage of life, more pain, more weakness, and more economic loss than trachoma. The voluminous literature on the various aspects of trachoma is striking testimony to its importance. It has been known from very early times; it has had many names; it is a practically universal disease. It is rife in the Far East, common in Mediterranean countries. It is occasional in Ireland, Northern Europe, and the United States. It is rare in England, Scotland, Scandinavia, New Zealand, and Canada. In large wars it has spread rapidly, to the great injury of the civilian population. An immense amount of laborious research has been expended upon its aetiology. The discovery of the cause has been claimed time and again; but the real cause still evades the most exhaustive research. In 1914 Axenfeld wrote an excellent monograph on the disease. Now Dr. Julianelle, chairman of the Trachoma Commission of Washington University, St. Louis, has compiled *The Etiology of Trachoma,* a monograph reviewing and

evaluating the results of an intensive research carried on for several years at his university. He considers the differential diagnosis, the epidemiology, aetiology, infectivity, and the many micro-organisms associated with the disease. He concludes that "the infective agent is a virus of remarkable fragility, succumbing before physical and chemical agents tolerated by numerous other bacterial and viral agents. Biologically it may be characterized as possessing a low infectivity, weak propagation powers, infrequent filterability, and poorly immunogenic properties. . . . Whether the virus may be interpreted in turn as the inclusion body, or more accurately the elementary form of the inclusion body, remains to be proved, although the evidence available at the present time suggests this may be so; whether, again, the elementary body may be interpreted further as a rickettsia must also await future investigations, which may reveal that the ultimate classification of the virus may become a matter less of fact and more of definition."

Dr. Julianelle's book ends with forty pages of bibliography classified according to the several aspects of the disease. The whole monograph is an admirably balanced piece of work.

MEDICAL RESEARCH EXPLAINED TO THE LAYMAN

Builders of Health. By David Dietz. English edition revised by A. W. Haslett. (Pp. 351; 29 illustrations, including a frontispiece; 16 diagrams. 12s. 6d. net.) London: George Allen and Unwin. 1939.

This is an excellent book. The author is lecturer in general science in the Western Reserve University, but the English edition has been revised by Mr. A. W. Haslett. The volume may at first, and not unnaturally, be received with some reserve or viewed with some suspicion, because so many publications of its kind attempting to popularize the facts of physiology and psychology and the more recent discoveries in the field of medicine are apt to be superficial or even a little inaccurate, and because a glance at the headings of the chapters suggests a slight flamboyancy of nomenclature. There are "medical magic," "the new wizardry," "the seven horsemen of death," the "magic" of nerves, of glands, of digestion, "the enchanted barnyard." There is no real harm in this if it serves to attract attention without creating a misleading atmosphere. As the reader pursues his way through the book he finds himself more and more interested in a fascinating story told in an attractive style. Most of it, too, is told in sufficient detail and at a sufficient depth, with the skilful introduction of some technicalities, to require concentration and thought on the part of the reader; so that if he follows it to the end it cannot fail to make an effective impression on his mind, and one which will not easily fade.

The book covers rather more than the usual ground of such productions or compilations. Part I sketches in outline the present state of medical knowledge, with special reference to biochemical research. Part II discusses briefly the seven diseases or conditions which are most death-dealing to-day. Part III deals with the progress in obstetrical practice; Part IV with the nervous system; Part V with the ductless glands and hormones; Part VI with digestion, the enzymes, and vitamins; Part VII with some of the main infectious or contagious diseases; Part VIII with the discovery and application of aids to diagnosis; and Part IX shortly with progress in surgery. Each of these sections is clear, accurate, and interesting, and facts and opinions seem always up to date. What some may consider a little disproportion between the sections is not unnatural. That on the glands is much the longest and perhaps the best. The author is more interested in physiology than in psychology, and modern knowledge and discovery in the latter field, though by no means omitted, are less adequately stated and expounded than might be desired.

The book remains predominantly American in outlook, but Mr. Haslett's revision for the English edition deserves commendation. He has here and there supplemented or replaced facts and figures to make them applicable to this country, and he has kept an eye upon the text so that a solitary survival of the spelling "goiter" comes upon one as a surprise.

THE MONTHLY CYCLE AND MARRIED LIFE

Der Zyklus der Frau. Reform des Ehelebens. By Dr. Jules Samuels. (Pp. 174; 43 figures. No price given.) The Hague: G. Naeff. 1938.

Endogene Endokrinotherapie in der Gynäkologie: Ätiologie und Behandlung des Karzinoms. By Dr. Jules Samuels. (Pp. 182; 32 figures. 4.90 florins; bound, 5.90 florins.) Leiden: A. W. Sijthoff. 1938.

Dr. Jules Samuels laments that a woman knows how the engine of her car works, but is carelessly ignorant of the wonderful mechanism of her own body. He has therefore written a book on the monthly cycle in women and reform of married life, wherein he describes, rather laboriously, the generative organs, endocrine glands, and in particular the hypophysis. Chapters 8 and 9 introduce his cycloscope, in essence a spectroscope, which is used for observing the reduction time of oxyhaemoglobin to haemoglobin in the woman's own interdigital tissue, which is put under pressure by a special light clamp. Daily readings are taken, and form a cyclogram—an individual record which it is suggested will become essential for a woman and be demanded by her doctor. In his interpretation of the normal curve Dr. Samuels finds the occurrence of ovulation generally thrice monthly from puberty till about 18, then twice monthly till the climacteric. He claims that divergencies from the normal and their cause can be thus recognized. He believes that the hypophysis controls the whole endocrine system by virtue of its two hormones, the thyrotropic and the gonadotropic, so that any glandular disturbance, primary or secondary, is reflected in the cyclogram; further, it can be corrected by short-wave treatment of the hypophysis with that of any interacting gland until equilibrium is restored. The succeeding chapters set forth the physiology of pregnancy. Straightening of the cyclographic curve is due to the production by the placenta of unvarying amounts of similar hormones replacing true folliculin and progestin, which are in abeyance. Some useful advice is given on the difference between the male and female response to sex stimulation. Important deductions from the readings of the cyclogram include "safe" (that is, sterile) periods, explanations of irregular bleeding, and also indications as to neoplasms, benign or malignant. If the author's observations can be confirmed, his contribution to our knowledge of endocrine action will be very great, and to our control of its activities enormous.

A short notice cannot attempt to epitomize or criticize the clear report of research work contained in the second of the two books under notice. Dr. Samuels's invention of the cycloscope breaks new ground, and his use of it has satisfied him that ovulation occurs at least twice monthly, and this explains such problems as intervals of infertility, intermenstrual pain, superfoetation, binovular twins. Further, by stimulating each main endocrine gland in turn, and plotting the resulting figures, Dr. Samuels obtains an electrodiagram. This amounts to an analysis of their state, and enables him, by a planned application

of short-wave treatment as stimulus or depressant, to restore hormonal equilibrium. As noted above, he holds that the hypophysis is the excitant of all other glands by means of two hormones—a gonadotropic and a thyrotropic. Neighbouring centres in the diencephalon are secondarily affected, so that treatment of the hypophysis may be part of the treatment of, for instance, diabetes, nephritis, or gastric ulcer. Endocrine disturbance is the primary cause of neoplastic growth, which is therefore susceptible to treatment via the hypophysis.

PHYSICAL TREATMENT

Physikalische Therapie. Richtlinien für den praktischen Arzt. By Professor H. Lampert. (Pp. 256; 131 figures. RM. 13.50; bound, RM. 15.) Dresden and Leipzig: Theodor Steinkopff. 1938.

A wide field is covered by this small book on physical treatment by Dr. Lampert. So many facts and theories are stated in a small space that the condensation which is thus made inevitable has rendered the book difficult to read, though helpful for reference purposes. This condensation has also affected the illustrations: for example, the charts on page 35 are reduced to such a small size that it is difficult to follow them, and the diagrammatic drawing of the subaqueous method of colon irrigation on page 193 is so small and so copiously annotated that a considerable amount of will-power becomes necessary before it can be deciphered.

Massage, hydrotherapy, light, radium, and electrotherapy are among the subjects with which the author deals. In these and other sections of the book he gives a useful statement of the rationale of each form of treatment before going on to discuss methods of application. In the chapter dealing with electrotherapy a great deal of space is given to short-wave work, but more illustrations would be helpful here. There is an excellent index, with the more important subjects printed in bold type, which will help the reader of this crowded book.

Notes on Books

The little book with the arresting title *Your Chest Should Be Flat: The Deep Chest Makes Better Soil for Tuberculosis*, by Dr. S. A. WEISMAN (Lippincott, 9s.), gives the chest measurements of a large number of children and adults, with particular reference to the thoracic index—that is, the ratio of the depth of the chest to its width. On the basis of these findings the author forms the conclusion already indicated in the title. Dr. Weisman repeats himself so much, wraps his analysis of results in so much verbiage, inexcusable even on the ground that the book is partly intended for laymen, that a reader would be forgiven for losing patience with the contents long before he reached the end. The book, however, contains useful data, clear charts, good photographs of children, and a large number of references.

A small book, *Essentials of Short-wave Therapy*, by Dr. K. R. SPEEDING (Melbourne, W. Ramsay), remains true to its title throughout. The physical principles are stated concisely and the comparison with long-wave diathermy is made particularly interesting. The biological effects of the current are stated briefly before passing on to the conditions in which short-wave therapy is indicated. Many of the illustrations of technique are in the form of clear and self-explanatory line drawings. The possible dangers of this form of treatment are alluded to, and mention is made of the danger of treating any condition where drainage is difficult. This is an important point which may be overlooked but which crops up again and again, and is most probably the cause of many failures in short-wave therapy. The whole book is remarkable for the clarity with which the matter is set out, and the chapter summarizing all that has gone before is particularly good in this respect. It conveys the impression that all its statements are based on the author's personal experience, and indeed the key notes of the book may be said to be sincerity and clarity.

Dr. ERWIN SCHLIEPHAKE'S *Behandlung rheumatischer Erkrankungen mit Ultra-Kurzwellen* is published at Dresden and Leipzig by Theodor Steinkopff, price RM. 7. This little handbook on the treatment of rheumatism with ultra-short waves is one of a series of publications dealing with different aspects of the problem of rheumatism. It describes the methods used by the author, well known as a pioneer worker in short-wave therapy, in treating rheumatic manifestations. The first part is devoted to the aetiology of rheumatism; then follows a short section on apparatus and technique. The last part, which is also the longest, deals with the indications for short-wave therapy. Cases are described and illustrated by *x*-rays, which are very well reproduced.

Traitement des Suppurations Pulmonaires, by VICTOR CORDIER, with the collaboration of P.-L. Mounier-Kahn (Masson et Cie, 32 fr.), is divided into three parts. In the first Cordier discusses the history, pathology, methods of investigation, and classification of pulmonary suppurations. The second part is a critical study of developments in treatment, and the last a discussion (with attractively presented illustrated case-histories) of the application of various therapeutic measures in different types of suppuration, based on personal observation since 1912 of over four hundred cases. This is a very useful but not very readable summary of a complicated subject, being written almost entirely in note form, with far too many subheadings and cross-references. The style is pungent and greatly influenced by the author's personal convictions. He concludes that at present it is not possible to estimate accurately the value of the various forms of treatment because of the many changes that have occurred during the last twenty-five years. He condemns postural drainage in no uncertain terms, however, considers bronchoscopy of value in some cases, and leans towards earlier surgical drainage.

The work entitled *Études sur la Rage* (Paris, Masson et Cie, 40 fr.), by Dr. P. REMLINGER, the director of the Tangier Pasteur Institute, and his assistant Dr. J. BAILLY, represents an ordered summary of more than 200 papers published since 1917, and all emanating from the institute which, according to the high authority of the late Dr. Charles Nicolle, is the most celebrated centre in the world for the study of rabies. The most important subjects dealt with are the diffusibility of the virus of rabies and its presence in the organs; the uniformity of street virus and the plurality of fixed viruses; rabies in Senegal and tropical countries; rabies in the guinea-pig and the cock; the behaviour of the virus in the brain of animals; the evolution of the fixed virus in the course of *passage* and the consequences which this course may entail as regards inoculation treatment; laboratory rabies; paralysis as a complication of inoculation; and immunization of animals by vaccines treated with ether or phenol. A chronological index of the publications of the Tangier Pasteur Institute from 1917 to 1937 inclusive is followed by a similar list of the publications of the Constantinople Pasteur Institute, of which Dr. Remlinger was director from 1903 to 1911.

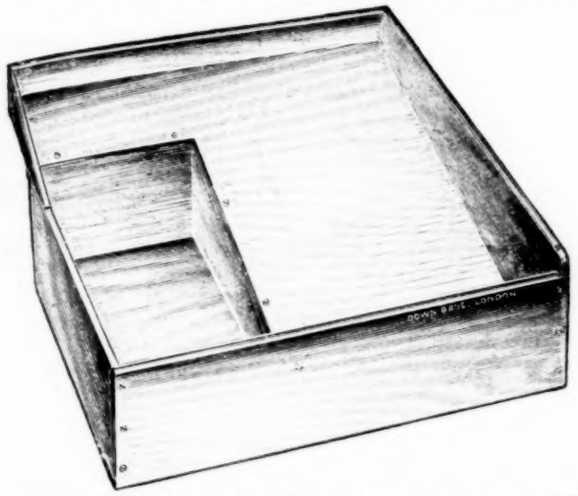
The Horse and Buggy Doctor, by Dr. ARTHUR HERTZLER, is published by John Lane at 12s. 6d. Pleasantly introduced by Dr. Francis Brett Young (the author of *Dr. Bradley Remembers*) this account of the life of a country doctor in Kansas has had a large sale in North America, where he has been described as "the Mark Twain of American Medicine." It is a graphic account of many queer experiences and is full of good stories.

Preparations and Appliances

BOX FOR MAKING PLASTER BANDAGES

Mr. CHARLES E. KINDERSLEY, F.R.C.S. (Bath), writes:

The box illustrated is now being manufactured by Messrs. Down Bros. in order to simplify the making of plaster bandages. The body of the box is filled with plaster and the bandage is made on the sloping portion, plaster being rubbed firmly into it and the bandage being rolled down the slope. This



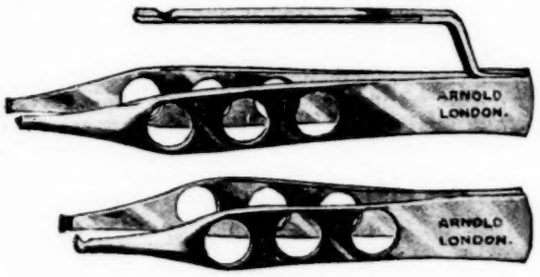
ensures a constant bandage, both in weight and consistency, and renders the time occupied in making a bandage infinitely shorter than by the old method of laying plaster out on a table and having to put it all away again. It can be mounted on legs or supplied to stand on a table.

CLIP FORCEPS

Mr. G. A. BAGOT WALTERS, F.R.C.S.Ed. (Lincoln), writes:

Michel's clips are deservedly popular for approximating skin edges; but, having been dissatisfied for some time with the various types of "clip forceps" which are available, I have devised a modification which seems to meet all my requirements.

The design of both "skin-approximating" and "insertion" forceps is based on the well-known Jeans dissecting forceps. The instruments which are illustrated here are made of stout gauge stainless steel with a blocked joint, giving a particu-



larly strong and rigid article, which is not unduly heavy owing to the half-inch fenestrations. These fenestrations afford a firm hold even when operating on stout subjects. The "skin-approximating" forceps has fine teeth which approximate accurately, and it carries a three-inch gallery which holds twenty-four clips, sufficient for almost any length of incision. The gallery on the model illustrated is designed for 16-mm. clips, but could of course be modified to take the more usual size. The "clip-inserting" forceps is five inches long, the teeth are grooved on the inner aspect to ensure a good grip on the clip and are only 0.15 inch wide to avoid picking off more than one clip at a time.

I have now been using these forceps in private and hospital practice for over a year, and they have proved most satisfactory. The instruments were made for me by Messrs. Arnold and Sons (John Bell and Croyden), Wigmore Street, London, W.1.

THE "FIRLE" EYE MAGNET

Mr. N. BISHOP HARMAN, F.R.C.S. (London, W.1), writes:

The magnet is a well-established instrument in ophthalmic surgery for the removal of foreign bodies of iron or steel from the eye. There are splendid electromagnets which are regularly used for the removal of foreign bodies from within the eye. But few surgeons use a magnet for superficial foreign bodies, probably because it is more expeditious to use a spud than to prepare the electromagnet, and ordinary magnets have been too weak for effective usage. Now an English firm (Gowllands of Croydon) have manufactured a most effec-

tive hand magnet which should be of much service to ophthalmic surgeons working in districts where iron and steel works are numerous and foreign bodies in the eyes of workmen common. This magnet is a cylindrical bar of steel, 4 inches long and ⅝ inch in diameter, weighing 4½ oz. It is of a steel alloy with a high cobalt content; it has a lower density and a much greater lifting force than the old carbon-steel magnets. It does not suffer from ageing, and is stable at fairly high temperatures and under ordinary mechanical shock. Also, it is stated to be very resistant to artificial ageing by external magnetic fields—for example, direct-current apparatus or lightning flashes. Its lifting power is amazing; a 1-lb. weight from the kitchen scales was lifted and held with ease. One pole of the magnet is drilled to receive interchangeable pole pieces with probe ends; of these there are four. The whole is chromium-plated. The pole pieces may be boiled, but the magnet is better sterilized by soaking in alcohol or 5 per cent. carbolic solution. The instrument was supplied to me by Messrs. George Spiller, Ltd., of 32, Wigmore Street, London, W.1.

PREPARATION FOR SHOCK THERAPY

Azoman (manufactured by Messrs. Boehringer Sohn and distributed in this country by Charles Zimmermann and Co. Ltd.) is a new agent for the convulsant treatment of schizophrenia. Its formula is ethyl-cyclohexyl triazol. Pharmacological and clinical trials have shown it to be about ten times as powerful as the usual analeptic substances. It is prepared in ampoules containing 0.1 gramme, and a table of dosage will be provided with the preparation.

SYNTHETIC OESTROGENS

Stilboestrol (Burroughs Wellcome and Co.) is issued in tablets for oral administration and in oily solution in ampoules for intramuscular injection. Burroughs Wellcome and Co. have also prepared stilboestrol dipropionate, which may be purchased by medical men desirous of making clinical trials. This compound is thought to have a more prolonged action than stilboestrol. The synthetic oestrogen stilboestrol has only recently been introduced into clinical use, but it would appear to have a wide range of possible therapeutic applications.

ONE HUNDRED AND SEVENTH ANNUAL MEETING OF THE

BRITISH MEDICAL ASSOCIATION

ABERDEEN, 1939

THE one hundred and seventh Annual Meeting of the British Medical Association will be held at Aberdeen next summer under the presidency of Dr. Thomas Fraser, consulting physician, Aberdeen Royal Infirmary.

The Sectional Meetings for scientific and clinical work will be held on Wednesday, Thursday, and Friday, July 26, 27, and 28, the morning sessions being given up to discussions and the reading of papers. The Annual Representative Meeting for the transaction of medico-political business will begin on the previous Friday, July 21. The full list of presidents, vice-presidents, and honorary secretaries of the scientific sections is printed with the provisional programme in the *Supplement* this week. Other details of the arrangements for the Annual Meeting will appear in subsequent issues. We publish below the third of a series of descriptive and historical articles on Aberdeen and its medical institutions. The first two articles appeared on December 31, 1938 (p. 1380), and February 18, 1939 (p. 336).

LATER HISTORY OF THE ABERDEEN MEDICAL SCHOOL

BY

JOHN CRAIG, M.B., M.R.C.P.Ed.

In every country a close connexion exists between the history of its medicine and that of its general civilization, and Scotland is no exception to the rule. In the eighteenth century the commerce and wealth of our land began to increase; the population rose and industry throve: a renaissance of letters accompanied the material prosperity; and the spirit of liberty and reform and progress abroad in the world was ready to "take a northern turn." The forward movement spread to medicine, but the universities did not supply the necessary energy. In Aberdeen, as elsewhere, our two universities were still steeped in mediaevalism and dislike of change, and the professorships of medicine were too often merely titular sinecures.

The change came from without. In Edinburgh the College of Surgeons and the College of Physicians took the lead in forming a real medical school in the second quarter of the century. In Aberdeen in 1789 twelve medical students, led by James McGrigor, constituted themselves a medical society for mutual help and instruction, and for making arrangements for extramural instruction by the physicians of the infirmary and the dispensary. Since its foundation this body (later named the Aberdeen Medico-Chirurgical Society) has continued to prosper, has stimulated advances in medical teaching, and has promoted the building of new hospitals and the enlargement of existing ones. The society played an important part in leading to the formation of a medical school.

A school of medicine cannot be developed within a university, and for its development the academic instruction of the professor must be supplemented by practice in hospital wards and clinics. It took many years for the universities in Aberdeen to realize this, and the hospital managers were also slow in appreciating their own importance in the general scheme of medical education. The making of the Aberdeen medical school is therefore a story, on the one hand, of the growth of the teaching of scientific medicine in the universities, and, on the other, of the foundation and rise of the various hospitals and medical institutions.

The Universities

In the eighteenth century Aberdeen had two universities, one—King's College—in the episcopal city of Old Aberdeen, near the mouth of the Don, and the other—Marischal College—in New Aberdeen, at the mouth of the Dee. Both colleges were mediaeval and scholastic in thought and practice; both had nominal mediciners who did little or no teaching of medicine; and between the two a constant feud prevailed. Several efforts were made throughout the century to unite the two colleges, but it was not until 1860 that union took place. Scientific and medical knowledge was increasing; greater teaching facilities in Edinburgh and other cities were being provided, and the Aberdeen students were not slow to realize that apprenticeship to a practitioner, however efficient, did not provide sufficient medical training.

Marischal College early in the nineteenth century took steps to institute what was almost a medical faculty, and lectureships were established in anatomy, midwifery, surgery, and materia medica. In 1818 a joint committee of the two colleges was appointed on the initiative of Marischal College to conduct a proper medical school, in which the subjects taught were botany, animal economy, surgery, practice of physic, materia medica, clinical medicine, and midwifery. This joint school lasted only twenty-one years, and from 1839 to 1860 separate schools were again in existence.

The union of the two universities in September, 1860, ended the jealousies and petty quarrels of nearly 300 years, and the change was a beneficent one for the teaching of medicine. New chairs were created, and a complete medical faculty was formed which could carry into effect all the newer ordinances through which medical education all the country over was being organized. The reorganization took place at a happy time for Aberdeen, for it coincided with the dawning of modern medicine. The last eighty years have seen constant improvements in teaching facilities: the foundation of new chairs and lectureships; increased clinical teaching in medicine, surgery, the specialties, and preventive medicine; and increasing collaboration between university and hospital, between theory and practice, "between the cloister and the hearth." This desirable state of affairs has recently been epitomized by the establishment of new university medical buildings on a common site alongside the voluntary hospitals of the city.

The Royal Infirmary

Early in 1739 the magistrates and town council of Aberdeen, then a Royal Burgh of 15,000, resolved to erect an infirmary for the burgh, for the care of the "diseased and infirm poor . . . to supply the honest laborious poor with advice, medicine, and every necessary care," and to "help those deprived of their reason . . . there being no place for detaining and restraining such unhappy persons either from doing hurt to themselves or others, and that they have not a proper diet, or the application of suitable medicines which might, by the blessing of God, tend to their cure or recovery." (The study of nutrition is apparently no new thing in Aberdeen!) In 1741 buildings were erected at a cost

of £484 on the Woolmanhill, and opened for the reception of twenty persons sick in body and mind; and soon the new hospital received the support of town and county and of rich and poor alike. Finance troubled the young institution then and since, as it should do all growing hospitals. Accommodation had to be increased from time to time, and the various extensions of benefits needed repeated calls for money, all of which were nobly answered. A new ward was opened in 1818; big additions were made in 1832–3, at a cost of £5,000, to bring the total beds to 182; and by 1840 230 beds were provided at a cost of £16,700 in a handsome building planned by Archibald Simpson, the well-known architect.

A convalescent home was established in 1873 at Lochhead, whence the work was transferred to Cults on Deeside in 1897. A big jubilee extension scheme was undertaken in 1887; and surgical and medical pavilions were opened in 1892 and 1897 at a cost of £75,300. These served the community until the completion of the new infirmary as part of the joint hospital scheme.

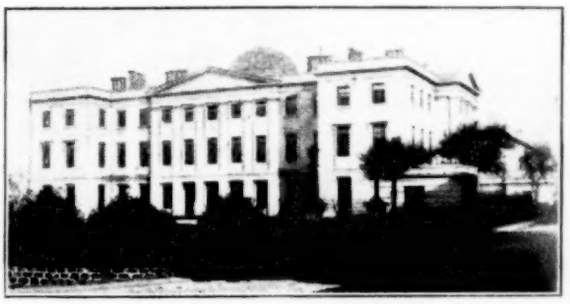
Aberdeen Infirmary, 1749

The Aberdeen Joint Hospital Scheme

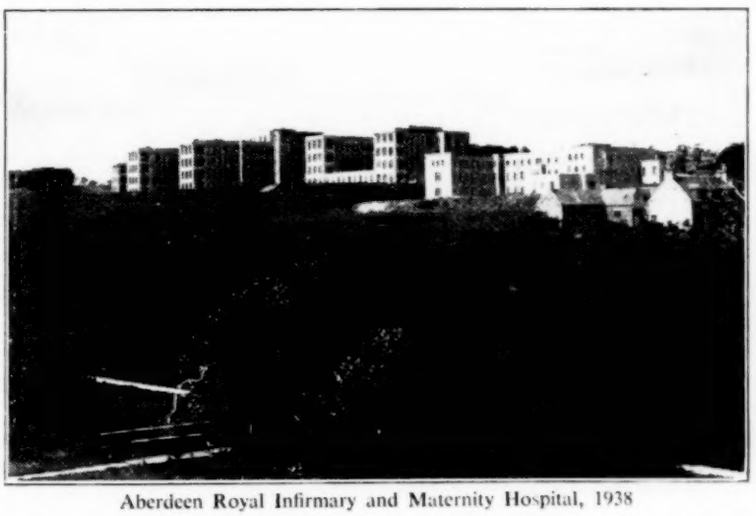
Before the war the need for increased hospital accommodation for men, women, and children began to be felt in Aberdeen, but extensions of the Royal Infirmary, the Royal Hospital for Sick Children, and the Maternity Hospital were not very feasible on their limited sites. Professor Matthew Hay was then the far-seeing head of the municipal health services, and to him was vouchsafed the vision of the concentration at Foresterhill of the Aberdeen hospitals and medical school and students' hostels, on a large common site on the outskirts of the city.

His proposals were laid before the Medico-Chirurgical Society in February, 1920, and in April of that year, at a conference in the Town House of representatives of the society, the Royal Infirmary, the Royal Hospital for Sick Children, the University, and the town council, the proposals were submitted by the society's president, Professor (later Sir) Ashley Mackintosh, and approved by all. Then came the difficult financial problem of converting the ideal into a reality. A fund of £100,000 was raised for the building of the new Royal Hospital for Sick Children on part of the common site, and the new hospital of 138 beds was opened in January, 1929, free of debt. It is built on the pavilion system, and can readily be extended. In 1927 the Lord Provost of the city, Mr. (later Sir) Andrew Lewis, began his Herculean task of raising funds for the other hospitals, and in two years collected £410,000, of which £350,000 was for the infirmary: surely a practical testimony to the generosity and philanthropy of the sons and daughters of our eastern corner of Scotland. The total cost of the buildings was about half a million pounds, and the remaining £100,000 or thereabouts was collected within a year by Lord Provost Edward Watt. In September, 1936, the new infirmary was opened by our King and Queen (then the Duke and Duchess of York).

The buildings are constructed of the local grey granite, and in their dominant cubic masses are united nobility, utility, and a strongly local character. In the western medical block are 146 beds on five floors: the central surgical block has 252 beds, also on five floors: the eastern block houses the departments of radiology and the wards, containing about 100 beds, for special diseases. Administrative buildings, nurses' homes, and kitchens have been built on modern and generous lines, while throughout the arrangements for the care of the patients are supplemented by those for teaching and research. Between the children's hospital and the infirmary lies the Maternity Hospital. Built also of granite, it has accommodation for thirty-four patients, and was opened in 1937. Plans are being prepared by the town council for the erection, in association with this hospital, of an ante-natal department, the work of which is at present being carried out in the old buildings on the Castlehill.



Aberdeen Royal Infirmary, 1854



Aberdeen Royal Infirmary and Maternity Hospital, 1938

The new university medical building is on the north of the common site. In striking contrast to the Royal Infirmary and Maternity Hospital, it is built on modern lines, of ferroconcrete faced with lime-washed brick, and holds the departments of pathology, bacteriology, biochemistry, medicine, surgery, midwifery, and medical jurisprudence, with suitable laboratories, lecture halls, and demonstration rooms. The opening ceremony was performed by Lord Dawson of Penn in October of last year.

When to the university block are added the buildings, already planned, for anatomy and physiology; when the hostels for students and the out-patient departments are

also built, then the great vision of a joint hospital scheme and medical school will be realized for the present. Professor Matthew Hay's dream is coming true; the enthusiasm of Sir Ashley Mackintosh and others is having its reward; and in the joint scheme a striking memorial exists to the far-seeing generosity of Aberdeen and district, which has provided a fine centre for medical treatment, teaching, and research.

SCHOOL MEALS AND MILK

The following is an abstract of the statement on school meals and milk submitted to the President of the Board of Education by the Children's Minimum Council on March 27.

Defective Feeding in Childhood

The modern teaching of nutrition has shown both that defective feeding in childhood causes damage which may be irreparable and also that the special needs of children for the costly protective foodstuffs and for first-class protein demand a much higher expenditure than was postulated when it was thought that their dietary needs could be expressed merely as fractions of those of adults. At present the main incidence of malnutrition falls on the child population—where its effects are the most harmful and most permanent. Many other inquiries into budgets and into milk consumption indicate that a very large proportion of children attending elementary schools cannot obtain in their own homes the food—and especially the protective food—necessary for the health and full development of their bodies and minds.

Present Provision of School Meals and Milk

The present provision of school meals and milk goes only a small way towards meeting even the most urgent part of the problem. For instance, a comparison between the present scales of unemployment pay and any recognized estimates of the minimum expenditure necessary for healthy living shows that parents depending on such an income cannot afford to feed their children properly unless they starve themselves. It is often assumed, however, that all children of unemployed or poorly paid workers can obtain free dinners and milk at school. And, indeed, the Government, in defending the scales of unemployment assistance against the charge of inadequacy for health, has claimed that "children attending school can obtain free meals if in need of them." A sample inquiry made in 1936–7 throws light on this statement. It covered 939 children of school age whose parents were members of unemployed clubs in different parts of the country; nineteen of these children were obtaining both free milk and meals, sixty-four free meals alone, and 230 free milk alone. For the remaining two-thirds no provision of any kind was made.

Provision for free meals is particularly inadequate in the country districts, where wages are low and it is often impossible for children to get home for dinner. In the towns both the extent and the kind of provision vary enormously from one place to another. Among the authorities which do provide dinners the differences in the proportion of children fed do not appear to bear any relation to the probable economic need, as measured, for instance, by the incidence of unemployment. The distress which increases the need for free feeding also makes it more difficult for the local authorities to put any additional burden on the rates.

The need for a more generous provision of free school meals will increase with the compulsory raising of the school-leaving age without maintenance grants. The Children's Minimum Council is gravely concerned with the danger that the authorities will be tempted to grant exemptions for children from the poorer families on economic rather than educational grounds. This danger could at least be mitigated by a much wider provision of free midday meals. The milk-in-schools scheme has been successful so far as it goes. But it does not go far enough. Only half the school population is obtaining milk at school; the usual ration of one-third pint is an inadequate one, and in only a few areas is the provision extended over the holidays. The Council submits to the Board the following proposals for the extension of the present provision.

Proposals for the Future

(1) That a daily ration of milk should be made available free of cost to all children attending public elementary and State-aided secondary schools. (The supply of free milk should be continued during the holidays and, where necessary, paid help should be engaged for its distribution.)

(2) That local authorities should be required to make provision for a midday meal in connexion with all schools for which they are responsible.

(3) That meals should be provided free for children attending schools under local education authorities who come from families where the expenditure available for food falls below a scale laid down by the Board in accordance with modern scientific requirements. (The Council suggests that the Board, in consultation with the Ministry of Health, should lay down a model scale which could be adapted to varying prices from time to time and from place to place.)

(4) That the Board should enforce proper standards of accommodation, service, and dietary.

VIRTUES AND DANGERS OF MILK

View of a British Association Subcommittee

The Nutrition Subcommittee of the newly formed Division for the Social and International Relations of the British Association arranged a discussion on March 28 on milk. Two hundred attended the meeting under the chairmanship of Sir RICHARD GREGORY.

In an interesting paper on milk and its importance in diet, Dr. HARRIETTE CHICK said that to-day milk was the nearest approach to a complete food that we possessed, but besides being the most nutritious it was the most inconvenient and at times most dangerous of foodstuffs. It was an excellent medium for bacteria, such as those responsible for tuberculosis, diphtheria, typhoid, scarlet fever, and undulant fever. As an exclusive diet it did not, however, contain enough sugar and minerals, especially iron. Young pigs, for example, showed signs of anaemia if they were not given other food besides milk. Dr. Chick said that skimmed milk was of value in virtue of its content of calcium and phosphorus, and she quoted an experiment of Sir John Orr's in which three groups of children were given an extra ration of whole milk, skimmed milk, and sweet biscuit, respectively. The first two groups, between which there was no difference, were superior to the third in height and weight. The mineral content was the important factor. Further steps should be taken to secure full use of this by-product in the manufacture of butter.

Professor J. C. DRUMMOND said that there was a great deal of misconception about the deleterious effects of heat on milk. The results of recent work on the effect of heat on food had removed much of the popular objection to pasteurization, and he had no doubt that the compulsory adoption of pasteurization was highly desirable. One sometimes wondered, he said, how much greater must be the mass of evidence proving the potential dangers of drinking raw milk before Government circles would recognize and admit that public health must come before political considerations. Dr. A. W. SCOTT of the Royal Technical College, Glasgow, said that deficiencies due to incorrect working of pasteurizing plant would be avoided if all plants were supervised under a compulsory scheme.

The meeting subsequently passed a resolution for submission to the Council of the British Association that it should support action for the compulsory pasteurization of milk.

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STERILIZATION OF DRESSINGS AND SYRINGES

If a surgeon during whose operation a fatal swab is left in the abdomen is not free of civil liability, what is the position of the surgeon or obstetrician who uses possibly unsterile dressings which are handed to him in hospital as "sterilized"? Sexagenarian students of a certain hospital in London will remember the suspicious surgeon who wrapped two eggs in the middle of a roll of dressings and, after it had been "sterilized," triumphantly displayed the unclotted egg-white. One who reads the work of Rishworth,[1] Hayes,[2] McGrath,[3] Underwood,[4] and Pulvertaft[5] would suspect that not all hospital sterilizers are invariably so adjusted and used as to kill all resistant spores of such organisms as tetanus and gas gangrene, if they are present in the dressings. Hayes is emphatic: "It has always appeared to me somewhat strange that we should accept dressings as bacteriologically sterile merely because they have been treated in a high-pressure sterilizer. Under the present methods in vogue there is no proof whatsoever that such dressings are sterile." How many persons responsible for the sterility of dressings—be it surgeon, theatre sister, or attendant—bear in mind that saturated steam under pressure (for example, 15 lb. at 120° C.) will kill ordinary resistant spores in twenty minutes, but that it takes about an hour to kill the same spores with hot air at 150° C? In an autoclave improperly used, or in the centre of a drum too tightly packed, an attempt is being made to sterilize dressings by hot air at perhaps 120° C. or less, because the steam has not displaced all air and penetrated every nook and cranny. The surgeon who thinks that the implication of this unwelcome argument is unjustified may be disturbed by a study of the papers mentioned above. He will find evidence that in a steam sterilizer, or even in a "vacuum sterilizer" of the hospital type, unless the whole process is in the hands of an expert the centre of a drum of dressings may not even have reached the desired temperature when the period of "sterilization" is ended, though, for efficient sterilization, it should be maintained for thirty minutes. McGrath points out that where penetration is poor even streptococci may survive in the centres of the bundles. We shall never know how many "sterile" dressings in the past have been inefficiently heated, for the tissues of the body must possess power to deal with small numbers of injected microbes if they are not too virulent—[2] and efficient laundry treatment, with the aid of soap, yields towels in a state approaching sterility before they are autoclaved. Are we, then, driven to conclude that only a hospital which has all its sterilizing apparatus under the complete control of the bacteriologist is safe? The bacteriologist will know that a mere reading of a pressure gauge on the autoclave may be useless; that even an automatic record of the temperature reached by a thermometer placed in the autoclave may be fallacious; that drum-windows must be open in the sterilizer; that unless steam is allowed to flow freely for many minutes through the escape valve (placed preferably at the bottom of the chamber and not at the side or top) or the vacuum attained is a "good vacuum," sterilization may not be achieved; and that safety cannot be ensured without continual control on his part, checked by the occasional enclosure of cultures of known highly resistant spores in the centre of the most tightly packed drum ever employed. He will know if and to what extent he can trust colour or other indicators. Rishworth describes what appears to be almost an ideal arrangement: a thermostat is inserted in a dummy drum inside the sterilizer, packed as tightly as any drum ever used for hospital work.

Another question arises. What is the proper method of treating skin, syringes, and needles when making injections? An annotation[6] in these columns last year on the risks of infection after inadequate sterilization of syringes was followed by a correspondence which showed the great interest taken by medical practitioners in this matter. At the risk of some repetition we will consider once more some of the difficulties involved. Presumably the ordinary procedure of rubbing the site of inoculation with spirit followed by a dab of tincture of iodine is reasonably effective. The solvent action of the alcohol on fatty exudate on the skin and in the hair follicles and sweat glands aids the removal of most of the microbes present; the iodine, even on momentary contact, would probably injure most staphylococci and streptococci, and the entering needle will in most cases convey into the tissue either no microbes or a very small number of non-pathogenic skin staphylococci. The twelve deaths at Bundaberg in Australia in 1928 showed the danger of issuing diphtheria

[1] *British Medical Journal*, 1938, **2**, 574.
[2] Ibid., 1937, **1**, 911.
[3] *Irish J. med. Sci.*, May, 1938, p. 218.
[4] *Textbook of Sterilization*, 1934, Pennsylvania, U.S.A.
[5] *British Medical Journal*, 1937, **1**, 441.
[6] *British Medical Journal*, 1938, **1**, 955; and correspondence from April to November.

prophylactic containing no antiseptic, for the Royal Commission was of opinion that the doctor had contaminated with his needle the uncarbolized contents of the bottle of prophylactic with a staphylococcus, which grew rapidly in the hot weather and caused the deaths of twelve of the twenty-one children injected. All are agreed that prophylactic should contain antiseptic, as it does, but how should the syringe and needle be treated? When giving an injection of vaccine, serum, or other medicament most medical men fill the sterile syringe with air and push the needle through the rubber cap into the inverted bottle, thus giving a momentary positive pressure which enables the syringe to be filled rapidly with the desired volume of fluid. If the needle is inserted through the cap while the plunger of a Record syringe is home a negative pressure arises in the bottle as soon as the plunger is pulled and bubbles of air are apt to leak past the plunger; froth appears in the syringe, and the bubbles may also leak through the needle up into the bottle of prophylactic, carrying with them any contamination that might be present in the syringe. The high risk in washing out a syringe with alcohol before use and storing it during use in a bowl of boiled water or saline is well known. In the instance reported by Allison[7] fourteen nurses out of forty injected suffered from abscess due to the same type of haemolytic streptococcus which was present in the throat of the nurse who presided over the bowl of boiled water containing the syringe and needles. The dangers of relying on alcohol or ether are clear; absolute alcohol or methylated spirit is a poor antiseptic; even 70 per cent. alcohol takes some minutes to kill ordinary pyogenic bacteria, and neither will kill spores. Although many men—probably the great majority—have employed this method without ever getting a case of sepsis, it is unsafe; and a practitioner defending a claim for damages on account of sepsis contracted in this way would be running a risk. The German doctor[8] whose injection apparently caused death from gas gangrene escaped censure only because the method of keeping syringes in alcohol had been taught in universities in Germany.

What is the conscientious man to do? One could argue at great length about the minutiae; the ideal method would consist in employing for each patient a separate syringe and needle and phial containing only a single dose. This would be costly and time-consuming. It is reasonably clear that the medical man must begin with autoclaved or heat-sterilized syringes and needles, and guard them during use, and must boil syringe and needle periodically in carbolic or weak alkaline solution during a session—the idealist would say, between each injection. The man who merely stores or places the syringe and needles in alcohol solution or previously sterilized water will leave himself open to attack. It would seem unnecessary to prescribe exactly how many syringes or needles should be used for a given number of persons; the doctor must "think bacteriologically," understand clearly the risks of the work he is doing, and shape his actions accordingly.

[7] *Lancet*, 1938, **1**, 1067.
[8] *British Medical Journal*, 1938, **1**, 955.

CAUSATION OF PEPTIC ULCER

The problem of the causation of ulceration of the mucosa of the stomach and upper duodenum has produced an immense literature in which are embedded hypotheses based on evidence which is either invalid or incomplete. An experimental approach has been difficult, and even in Professor F. C. Mann's review of the most recent work, which we publish this week, he does not claim that the problem has been solved by any of the investigations so far undertaken. Most writers agree that the presence in a resting stomach of an excessive amount of gastric secretion of high acid and ferment content is an essential factor in the aetiology of peptic ulcer, if not in fact the local causative agent. D. T. Davies and A. T. M. Wilson[1] in a long series of patients demonstrated that ulceration could be correlated with a preceding and persisting emotional disturbance in almost 84 per cent. of cases. When this emotional disturbance was composed there was a tendency for the ulceration to heal, sometimes with a speed which appeared incredibly rapid. It may be that these authors have provided an explanation for the increasing number of cases of peptic ulcer that are seen in times of economic stress. If it can be shown that in man psychological disturbance leads to ulceration by an abnormal stimulation of gastric secretion by some parasympathetic nervous pathway, support is found for Rokitansky's original suggestion,[2] made in 1849, that peptic ulcer is the result of a "morbid condition of the vagus nerve."

The studies of Professor Mann and his coworkers have been directed along two lines of investigation: (1) the production of pathological changes in the stomach by various methods, such as the administration of cinchophen and other drugs; and (2) studying the effects of normal gastric secretion on intestinal mucosa when mixing of the gastric secretion with the duodenal contents is prevented by one or other of several methods of operative short-circuiting. The ulcers observed

[1] *Lancet*, 1937, **2**, 1353.
[2] *Manual of Pathological Anatomy*, Sydenham Society, London, 1849, **2**, 22–46.

when the first method is used are essentially the outcome of pathological changes in the blood vessels of the fundic region of the stomach, leading to an interference with the nourishment of large or small areas of gastric mucosa. Either single ulcers or extensive areas of acute erosions are produced. If the abnormal conditions are obtained by the use of cinchophen the withdrawal of the drug leads to rapid healing. This type of ulcer is preceded by an acute gastritis of varying degree, and therefore belongs to a group entirely distinct from those ulcers which develop in the pyloric region of the stomach, the duodenum, or upper jejunum, with an otherwise apparently normal gastric mucosa. This type of ulcer, which Mann and his colleagues obtained by short-circuiting operations, other workers have observed after the stimulation of a part of the basal regions of the brain. Heslop[3] showed that in the hypothalamus there were two different physiological areas—one which on stimulation produced excessive acid secretion; and the other, excessive secretion of mucus. It seems likely that peptic ulceration of the second type described by Mann is identical with that obtained when excessive acid in the stomach secreted as a result of stimulation of the hypothalamus acts on normal mucous membrane. It is probable, too, that this is identical with the type of ulceration which Davies and Wilson could correlate with psychological disturbances. Mann's studies therefore seem to point to a clear division of peptic ulceration into two categories. The first is the "inflammatory" group, in which gastritis precedes ulceration. The second is the "hypersecretive" group, in which a healthy mucous membrane is, from nervous influences, stimulated to oversecretion: thence follows a local destruction of mucosa of some region which is not normally subjected to the contact of unneutralized, unbuffered, and undiluted gastric juice, probably poor in mucus content.

ASPECTS OF CHEMOPROPHYLAXIS

With the possible exceptions of lymphogranuloma inguinale and trachoma, virus diseases are uninfluenced by treatment with sulphonamide compounds. This is not to say that their bacterial complications cannot so be controlled, and an unduly optimistic report which appeared last year on the chemotherapy of distemper in dogs was based on results of which this effect is the probable explanation. The two principal virus diseases in man which are commonly complicated by bacterial infection are measles and influenza, and there is a strong *a priori* case in favour of an attempt to prevent secondary infection in these two conditions by chemotherapeutic means. Perhaps in influenza this case is not so strong, since this disease more frequently runs an uncomplicated course and, when it does not, its flora is varied. In measles, on the other hand, otitis media and bronchopneumonia are both common, and are frequently due, the former wholly and the latter at least in part, to infection by haemolytic streptococci. Either of these complications may leave a legacy of permanent damage, and a serious attempt to prevent them is therefore fully justified. That this can be done, at least in a large proportion of cases, seems evident from the studies of Dr. Thomas Anderson and Dr. J. C. Hogarth, described on pages 716 and 718 of this issue. In both their series of cases the frequency of otitis media, cervical adenitis, and bronchopneumonia was considerably less in the treated cases than in untreated controls. The only discrepancy between these two reports concerns gastroenteritis. Dr. Hogarth, who used proseptasine, is emphatic that this condition is uninfluenced, but Dr. Anderson, using sulphanilamide, had only five such cases in his treated group and twelve in his controls. Sulphanilamide is known to have an action on several intestinal pathogens of the genus *Bacterium*, whereas proseptasine is not—a fact which may or may not have some bearing on this point. Neither author observed any serious ill effects from the treatment, which therefore appears to have everything to commend it: doubts can only continue on the question of which of these compounds it is best to use, and perhaps on the optimum dosage. The advantages of similar treatment with a prophylactic purpose in obstetrics are perhaps unduly minimized in the letter by Professor R. W. Johnstone which appeared in our last issue (p. 692). His conclusion that the routine administration of sulphonamide compounds to all cases during the puerperium serves little purpose will be generally accepted, but it should be observed that his fatality rate in both treated and untreated cases (about 1 per 1,000) is so low that no conclusion with reference to the prevention of puerperal septicaemia is justified. If a comparison between two deaths in one series and three in another were of any significance, and if any conclusion were to be drawn from the relative frequency of morbid puerperia without bacteriological data, it would then be necessary to take into account the fact that the drugs used were prontosil and proseptasine, and results obtained with these are not necessarily those to be expected from sulphanilamide. There is abundant evidence that prophylactic treatment with sulphanilamide confers a high degree of resistance to streptococcal infection, and a complicated labour involving undue risk of such infection, or contact at the time of labour with a known source of such infection, is considered by many to be an indication for this measure of protection.

APPRECIATION OF VIBRATION

Echlin and Fessard[1] have recently drawn attention to several different views on the receptors concerned with the appreciation of a vibratory stimulus. Whereas certain workers concluded that vibration was appreciated by means of the tactile organs and no others,

[3] *Brit. J. Surg.*, 1938, **25**, 884.

[1] *J. Physiol.*, 1938, **93**, 312.

some among them held that the end organ was a specialized one and some that it was simply a pressure receptor. Others considered that vibratory sensibility could arise from any receptor, superficial or deep. Head took the view that only those receptors concerned in the appreciation of position and passive movement were involved, and said: "The tuning fork produces rapidly repeated movement of small range; these can be recognized provided the appreciation of passive movements is shown to be normal." Clinical observation supports the opinion that receptors in the periosteum are especially sensitive to vibrations, for a tuning fork produces its maximum effect when its base is placed upon a bone or joint; little sensation is experienced if it is placed upon the belly of a muscle. This, of course, might be expected from the physical properties of bone. The contention that since the vibration sense is unimpaired in severe muscular atrophy the receptors cannot be present in muscle carries little weight. It was shown many years ago that the muscle spindles ("stretch" receptors) are unimpaired in atrophy following section of the peripheral motor neurons and also in extreme atrophy of muscle in man. There seems to be no good reason for rejecting the possibility that the receptors in muscles and tendons may be involved in the sensation of vibration, but there is the difficulty that these receptors, which are concerned with position and passive movement, adapt slowly. Discharges from these receptors pass up the nerve during movement of a limb and the frequency of discharge remains altered for a considerable time after the actual movement is ended, and, as pointed out by Echlin and Fessard, it is difficult to see how they could give rise to "other than a perfectly continuous sensation." Changes in frequency of discharge in afferent nerves are in general interpreted centrally as intensity variations, but variations in frequency can be recognized as such when a vibrating stimulus is used. Echlin and Fessard, using the now familiar oscillograph and loud-speaker technique, found that the application of a vibrating tuning fork to the bony parts of the lower limbs of cats, while recording from the sciatic, femoral, or common peroneal nerves, produced in the loud-speaker a faint sound of the same pitch as the fork. If the animal's foot was plantarflexed so as to stretch the anterior tibial group of muscles when recording from the peroneal nerve the sound produced increased in loudness; on dorsiflexion the sound diminished or completely disappeared. These observations show that the vibratory stimulus activates the deep receptors and that the "stretch" receptors may play an important part. When a tendon to a muscle is stretched a complex asynchronous discharge of nerve impulses results from stimulation of the "stretch" receptors. The application of a tuning fork to the string maintaining the tension caused this asynchronous discharge to be replaced by a synchronous discharge of frequency identical with that of the tuning fork. From this experiment it is concluded that the synchronous discharges were due to stimulation of the "stretch" receptors, and this is further supported by the fact that no evidence of synchronous discharge remained after removal of the vibrating stimulus. In later investigations the skinned leg of a cat or rabbit was employed; with these application of the base of the tuning fork to the tibia produced little or no synchronized discharge in the common peroneal nerve until the anterior tibial group of muscles was stretched. The best response was got from stretching the tibialis anticus and recording from the nerve to this muscle. Using the isolated peroneus longus of the cat with its nerve attached, or the gastrocnemius of the frog, records of synchronous discharges were obtained when the tuning fork was applied to the paraffin block to which the muscle insertions were fixed, provided the tendon was on the stretch. Thus it would appear that the bones passively transmit vibrations to the "stretch" receptors and that the latter are little affected if the muscles are flaccid. In the intact unanaesthetized animal the normal muscle tone would maintain a sufficient activity in the receptors to make them always ready to respond to the vibrating stimulus. Discussing the question of central interpretation, Echlin and Fessard consider that the complex afferent discharges demonstrated in their experiments offer patterns special to a vibratory stimulus and to no other, and may therefore be regarded as giving rise to a specific sensation. Afferent impulses in general are somehow smoothed out in the sensory centres, and so the vibration sensation should be regarded as due to some at present unknown process, which prevents the smoothing out and thus allows of the establishment of large regular oscillations of the central excitatory state. The difficulty already mentioned of a sensation of vibration arising from intermittent stimulation of a slow-adapting receptor such as the "stretch" receptor is in part met by Echlin and Fessard's results with low-frequency stimulation of simple "stretch" receptors in the frog's toe muscle. The responses in the nerve often occurred in small groups of a few impulses separated by intervals of rest, a state of affairs which might reasonably be expected to set up periodic central variations in intensity not distinguishable from what we understand by vibrations. By a process of integration of the discharges these authors visualize a large fluctuation in the central excitatory state when each individual composite wave in the synchronized discharge arrives at the appropriate centres. Such fluctuations would give rise to sensations which would be interpreted as fluctuations in tension or movement, a picture of the event not significantly different from that put forward by Head.

EDUCATION PROBLEMS

The problems of modern education are, naturally, of prime importance to schoolmasters and schoolmistresses, and it is teachers of all grades who must be regarded as the experts in that field; but the main problems in their wider aspects have great interest for members of the medical profession and often have a distinct bearing upon matters with which medical practitioners are concerned. The addresses given at successive conferences for young public school masters held at Harrow School have attracted a good deal of attention, and

those given at the fourth such conference held a year ago should not go unnoticed. They are published in a volume entitled *Problems in Modern Education*, edited by Mr. E. D. Laborde.[1] The main theme posed for the conference was "The Educational, Social, and International Relevance of Christianity in the Modern World," and the four addresses included in Part I of the book deal with this topic, in relation to education mainly. In Part II there are eight addresses of a more varied character, and in an appendix Mr. A. C. Cameron, secretary of the Central Council for School Broadcasting, deals briefly with "Broadcasting and Education." All the addresses are of wide interest, of a non-technical character, and contain points worthy of consideration; but probably the most valuable and distinctive are those by Sir Cyril Norwood under the general heading of Part I, and that on "The Crisis of Freedom in Education," by Professor Clarke, Director of the Institute of Education, University of London, and, in perhaps a lesser degree, the concluding address by Mr. S. H. Wood on "The Relevance of Education to Behaviour." The first contains a powerful and reasoned claim that national education ought to be frankly based on Christianity conceived of in a broad spirit. In the second is a very suggestive discussion of the limitations of freedom by convention or social codes, and the need for cultivating intellectual integrity and a real acceptance of individual responsibility. In the third, three test questions are led up to and asked: "Do you know how to entertain a new idea? Do you know how to entertain the other person? Do you know how to entertain yourself?" The thoughtful reader cannot fail to profit by the particular addresses named.

[1] Cambridge University Press. 8s. 6d.

PSITTACOSIS FROM SEA-BIRDS

The Faroe Islands were visited for the first time in 1930 by an unusual type of pneumonia, of which further examples have arisen annually since 1933, the total number of cases now amounting to 174. The disease is a wandering bronchopneumonia of several weeks' duration, with a general condition resembling the typhoid state and a mortality of 20 per cent. With a single exception the onset of every case in each year has occurred between August 30 and September 25, and since there appeared to be no tendency for the infection to spread from person to person there had clearly to be some external source of infection at this very limited period of the year. It is at this season that the islanders are engaged in catching the young of the fulmar petrel (*Fulmarus glacialis*), which serve them as food not only at the time but during the ensuing winter; about 100,000 of these young birds are caught on the water before they can fly, and those to be stored are drawn, plucked, and salted. A local practitioner in the islands suspected that the disease apparently conveyed by these birds might be psittacosis, and invoked the aid of the Robert Koch Institute, Berlin, and the State Serum Institute at Copenhagen to prove it. The results of the ensuing investigations are now reported by E. Haagen and G. Mauer and by R. K. Rasmussen-Ejde.[1] Large consignments of the young birds and material from cases of pneumonia were flown to Copenhagen. Suspensions of liver and spleen from groups of birds injected into mice produced in several cases a fatal and further transmissible disease with all the characters of psittacosis, including the presence of elementary bodies stainable by Castaneda's method; the virus was also characteristically lethal for parrots. Material from one fatal human case produced the same condition in mice, and the serum from each of three cases sent to Professor S. P. Bedson in London gave a strongly positive complement-fixation test for psittacosis. The disease in the Faroe Islands, therefore, is psittacosis. It is considered likely that infection takes place owing to the inhalation of dust from feathers during plucking; this is the more likely since this task falls to women, among whom the great majority of the cases occur. This discovery raises two questions, which these authors discuss. One is merely that of nomenclature: if psittacosis is not confined to parrots it possibly deserves a name of wider connotation, but the suggested alternatives "virus pneumonia" and "epidemic pneumonia" are both open to criticism, the latter because the term "epidemic" implies case-to-case spread, which rarely if ever occurs in this disease. A question of much greater importance is whether the natural reservoirs of this infection are still more numerous than is yet known. It is conceivable but most unlikely that the Arctic petrels have recently been infected from a human source; it is probable that the psittacosis virus is a natural virus of this bird, and if species so dissimilar and geographically remote as parrots and petrels are both affected there may well be others. As an unrelated example of a newly observed natural source of infection, which nevertheless has a feature in common with the foregoing in that both are aquatic, we may mention that D. H. Miller[2] describes a case of tularaemia due to a prick from the fin of a catfish. His patient knew of others where infection followed dressing the same catch of fish, and since the victims had seen sick rabbits fall into the river and drown, it is supposed that their carcasses had contaminated the water.

[1] *Zbl. Bakt.*, 1938, **143**, 81, 89.
[2] *Milit. Surg.*, 1939, **84**, 23.

OPHTHALMOLOGISTS IN SESSION

It is something of a tradition with the Oxford Ophthalmological Congress to have distinguished foreign oculists address its meetings. The Doyne memorial lecture has served a useful function if only that it has attracted workers from abroad to the most delightful of English ophthalmological meetings. The second part of volume 57 of the *Transactions of the Ophthalmological Society*[3] is very largely taken up by the proceedings of the Oxford Congress held last July, and the cosmopolitan atmosphere of that gathering was apparent even more strikingly last year than on previous occasions. Dr. J. A. van Heuven of Utrecht contributed a paper on

[3] London: J. and A. Churchill. 30s. for the two parts.

papilloedema. A useful Hungarian contribution to the technique of plastic surgery was made by Dr. Ida Czukrász. The Doyne memorial lecture was delivered by Professor A. von Szily of Münster, and Professor A. Lauber of Warsaw contributed a paper on the treatment of tabetic optic atrophy. The United States were represented by Dr. Bernard Samuels of New York, speaking on the pathology of retinal detachment. In spite of this galaxy of talent and the high standard imposed by these contributors, native ophthalmology was no less strongly represented. Professor von Szily's lecture was a welcome reminder of the fact that to the modern ophthalmologist cataract is no longer a non-differentiated group of lens opacities. Professor Lauber's contribution, while opening a hopeful approach to the treatment of tabetic optic atrophy, has yet much criticism to overcome, for the work of Sobanski, on which his paper is largely based, has yet to obtain general acceptance. Mr. Ridley's contribution, bringing out the presence of a histamine-like substance in tears, adds to the little that is known of the physiology of this most important tissue fluid. The excellent summary by Mr. Traquair on the present position of anaesthesia in ophthalmic surgery is a clear guide, not only to what has been achieved, but to the difficulties yet to be overcome.

TWENTY-FIVE YEARS

To those who would like to follow the changes in medical education, the varying conditions in medical practice, and the advance in public health organization in the United States of America during the past quarter of a century a collection of addresses by Dr. Ray Lyman Wilbur, now published under the title, *The March of Medicine*,[1] may be commended. The addresses are arranged in chronological order: the first was delivered in June, 1913, and the last in November, 1937. This is probably the most convenient arrangement that could have been adopted. Though it separates some which deal essentially with the same aspect of the general subject of the book, that subject—medical education and medical sociology—is so wide and yet so essentially unitary that its aspects cannot be kept in compartments or dealt with entirely sectionally. It follows that there is in the volume a good deal of repetition and overlapping; but even this may be instructive and have some advantages. It would be idle to pretend that all these addresses were of equal value: most readers will think that some of them—not always the same—were scarcely now worth reprinting, however valuable they may have been at the time of delivery. They contain a great deal of wisdom, and though the general point of view and the conditions depicted are naturally American, much of this is directly applicable to this country. The most valuable from this standpoint are probably those on the medical curriculum and on the future practitioner—not merely the two which are printed under those specific titles but also those which can be easily picked out as related thereto. They have the advantage of emphasizing many of the points which are the basis of the policy enunciated by the British Medical Association, and of stressing the human as well as the scientific side of general medical practice and the need for an organized medical service being something more than a great machine for grinding out public health.

[1] California: Stanford University Press, 2.75 dollars; London: Oxford University Press, 12s. 6d.

INVESTIGATION INTO FITNESS

The Medical Committee (under the chairmanship of Lord Dawson of Penn) of the National Fitness Council for England and Wales has appointed two subcommittees, the first, under the chairmanship of Sir Adolphe Abrahams, to investigate the effect of violent exercise on girls and women from the physical, the nervous, and the psychological point of view, and the second, under Dr. G. E. Friend, to study the criteria of fitness at present applied to different sections of the community. The "Criteria" Committee is considering a form which might be used as a basis for the medical examination of adolescents, particularly members of voluntary clubs and youth organizations. The advantages of medical examination are undoubted, and the committee believes that there should be some agreed basis for examination so that records from various sources can be correlated.

HARVEY CUSHING

At the eighth annual meeting of the Harvey Cushing Society the seventieth birthday of this man of many friends and followers is being celebrated to-day (April 8) at the Yale University School of Medicine, New Haven, Connecticut. The programme for April 6, 7, and 8 includes a large number of papers and demonstrations on neurology. The president of the society, Louise Eisenhardt, reads a paper on basophil adenomas, and then Harvey Cushing speaks on pituitary adenomas and their surgical end-results. Professor John Fulton, who is a very active but unobtrusive promotor of this affectionate tribute, will make some informal remarks on: "To the South Seas in Quest of Tarsius," and at the annual dinner Harvey Cushing will respond to the birthday-party greetings. His many friends hope that he will long enjoy the honorary membership of the Harvey Cushing Society.

We publish this week a letter from the Secretary of the National Radium Commission on the storage of radium in war-time. It is most important that all persons who have radium in their custody or possession should notify the Commission, stating the amount of radium held.

Dr. Robert Hutchison was re-elected President of the Royal College of Physicians of London on April 3.

The name of Dr. B. H. C. Matthews, physiologist on the Flying Personnel Research Committee, was inadvertently omitted from the list of those mentioned as specialist members of that committee in the leading article published last week (p. 677).

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

PREVENTION AND TREATMENT OF BED-SORES

BY

V. ZACHARY COPE, M.S., F.R.C.S.

A bed-sore is an ulcer or area of impaired nutrition of the skin and subcutaneous tissues due mainly to the too great or prolonged pressure on those parts of the body that are most subject to pressure when the patient lies in bed. The body is not homogeneous in consistency nor does it lie evenly on any ordinary mattress which may support it; some parts of the skeleton project and take more than their fair share of the weight, and it is over such projections that bed-sores form. If the weight of the body could be evenly distributed over the whole of the surface that is in contact with the mattress, bed-sores would be exceedingly rare. The nearest approach to this even support results when a plaster-mould of the posterior half of the body is fashioned and the patient is allowed to lie on the mould. If the plaster be correctly made it is possible for the patient to lie on it for months without changing position or having any attention paid to the back, and at the end of that time the skin of the back will be quite intact and healthy. Consideration of this fact throws much light upon the principles which should guide us in the prevention and treatment of bed-sores.

A bed-sore is really a form of pressure-gangrene, but though pressure is the main factor there are important subsidiary points to be considered. These subsidiary factors may be external or internal. External factors consist chiefly of slight traumata caused by the friction of clothes or irregular rucks in the sheet upon which the patient lies; and the irritation of the skin by urine, faeces, or sweat. Quite apart from the irritation which may be caused by these, the moisture soddens the superficial epithelium and makes it less resistant to pressure. The internal or constitutional factors consist of those diseases which lower the blood pressure or diminish the vitality and blood supply of the tissues. This is a large group of conditions comprising all debilitating diseases and a very important group of nervous diseases (especially paraplegia) in which the absence of sensation and the impossibility of normal vasomotor reaction make the prevention of bed-sores extremely difficult. It is also clear that emaciated patients whose bones project more than usual will be more prone to develop bed-sores.

The most common positions for bed-sores are in the region of the sacrum, over the prominences of the scapulae, the heels, and the back of the head, and over any vertebral spine which may be at all prominent. A sore may develop over the elbow or the iliac spine, and if the patient lies on his side a sore may appear over the great trochanter. It must be remembered that the nutrition of *any* part which is subjected to continuous pressure may suffer, and the medical attendant must keep watch for the effects, which will vary according to the posture the patient may adopt.

The diagnosis of a well-developed bed-sore is, as a rule, quite easy, for the unhealthy ulcer which often spreads from some focus of pressure tells its own tale. It is much more important to recognize the earlier stages when the sore either threatens or is inevitable. When a sore is threatening to develop the skin will be found to be slightly reddened and tender; the redness will disappear on digital pressure and will reappear when the pressure is removed. This follows from the fact that the first stage is merely an erythema or congestion and the vascular supply is still intact. When a sore is inevitable the colour changes to a dusky or purplish red, and since the circulation in the part is arrested the pressure of the finger will not be followed by the phenomenon described above: there is capillary stasis. When this stage has been reached it is inevitable that some necrosis of tissue and consequent ulceration will result. In some cases a sore begins as a small crack in the skin from which ulceration spreads.

Preventive Measures

In no department of medicine is the proverb "prevention is better than cure" more applicable than in the case of bed-sores. In the great majority of cases it is possible, and customary, to prevent them; and with well-trained nurses it is usually considered a reflection on their nursing capacity if a sore develop. The nurse prevents bed-sores in three ways: first, by avoiding undue pressure on any one part; secondly, by preventing the infliction of minute traumata; and, thirdly, by improving the circulation and increasing the resilience and elasticity of the skin. It is the doctor's part to improve the general condition and vitality of the patient, and to give advice when sores threaten or form.

AVOIDANCE OF UNDUE PRESSURE

For this purpose it is necessary to see that the mattress is firm enough to prevent the body sinking deeply into it, and yet soft enough to allow it to be moulded to the contour of the patient's body. A firm hair mattress is customary. In those cases of very ill or feeble patients where special care is necessary a water-bed is sometimes used. The water-bed, which is put on top of the ordinary mattress, must only be half filled with water (at 100° F.). A fully filled water-bed would be as objectionable as a very hard mattress, and one less than half filled would allow too much sagging of the body. Water-beds are rather troublesome and many prefer to use a pneumatic mattress or, more commonly, air-cushions instead. Circular air-cushions or circles of sorbo-rubber are used to take the pressure off any particular part; air-cushions must be only half filled with air, and must form a large circle, with the affected part in the centre. Too small a cushion may cause oedema of the included part and actually do harm. Cushions must be well covered with linen. There are on the market some horseshoe-shaped rubber cushions (Dunlopillo) that are designed to avoid oedema of the included part.

CHANGE OF POSTURE IN BED

Normal people always change their position in bed as soon as any discomfort indicates the need for it. Sick patients cannot do this, so the nurse must do it for them in order to avoid too prolonged pressure on any one part. In altering the position of a patient the body ought not to be rolled over, but rather lifted gently so as to effect the change.

AVOIDANCE OF MINUTE TRAUMATA

The greatest care must be taken to avoid slight injury to the skin when the bed-pan is used; in persons who are recovering from an anaesthetic and in those who are paraplegic it needs a careful hand and a vigilant eye to see that the skin is not damaged by hot-water bottles. Dry bread-crumbs or rucks in the sheet or draw-sheet may cause unnecessary friction. The rather rough way in which an abdominal binder is pulled from under a patient who is about to undergo an abdominal operation might cause dangerous friction to the sacral region; in such cases the patient ought to be gently raised while the nurse withdraws the binder.

MAINTENANCE OF NORMAL CONDITION OF SKIN

This is done by keeping it clean and dry, by massaging and in some cases hardening it. In an ordinary patient the pressure-points are attended to twice daily (morning and evening) and after the bed-pan has been used. In feeble patients and in those who are incontinent the toilet must be done every four hours or even every two hours. The special areas, particularly the sacral region, are washed and gently and firmly massaged by the palm of the hand and the pulp of the fingers working in the lather formed from white windsor or other good soap; after five or ten minutes' massage the soap is washed off, the skin dabbed with a dry clean towel, and some form of spirit is then rubbed into the skin. Usually ordinary methylated spirit is used, but eau-de-Cologne or even brandy may be employed if wished. After the spirit has been well rubbed in, the part is thoroughly dusted with talcum powder or similar preparation.

With incontinent patients it is of the utmost importance to keep the skin dry. The draw-sheet must be changed frequently and frequent attention given to the skin. Usually a preparation of equal parts of zinc ointment and castor-oil is applied with the object of keeping the skin dry, but such ointment is disliked by some in that it may soil the linen; this soiling may be avoided if the ointment be used sparingly. When a bed-sore is threatening every effort must be made to change the position of the patient so that the affected part is relieved of pressure, and the skin must be attended to at least every two hours.

Treatment of the Inevitable Bed-sore

When, by the discoloration of the skin and the demonstrable lack of capillary circulation, it is recognized that a bed-sore is inevitable, it is recommended by Latimer that the area be hardened by means of tannic acid solution. A 5 per cent. aqueous solution is sprayed on at half-hourly intervals and the part dried by warm air provided by radiation from electric-light bulbs or other source of heat. This method of treatment is less likely to be followed by sepsis than when the part is treated by fomentations. The dried slough will ultimately separate and leave an ulcer, which can be treated by one of the methods here described.

When a definite sloughing ulcer is present it must be specially treated in one of the following ways. For small and even moderate-sized ulcers there is no doubt that the application of elastic adhesive plaster, as advocated by Carty, is useful.

"Two pieces of elastic adhesive plaster, one over the other, are applied so that the bed-sore and the skin surrounding it for at least an inch are covered. The elastoplast is left in position as long as it will adhere—usually, in the early stages when the discharge is plentiful, twelve to forty-eight hours. It is then replaced by similar pieces of adhesive plaster, and this is repeated until healing is complete."

If the elastoplast treatment is adopted it is essential to see that the whole of the ulcer and a considerable area of healthy skin round it are completely covered up; *and the plaster must not be removed to see how the ulcer is progressing.* Only when it becomes loose should it be replaced by a new piece or pieces. By means of this treatment large and deep ulcers may sometimes be induced to heal. Latimer points out that the elastoplast method is not suitable for cases in which there is involvement of bone, virulent infection, or profound necrosis of tissue. If the elastoplast treatment is not adopted the above-described tannic acid application may be tried.

There are still many who prefer to treat bed-sores by the older-fashioned methods of astringent or antiseptic applications. There are many to choose from. Dakin's solution helps to separate the sloughs and clean up the surface of the ulcer. Hypertonic saline solution (5 to 10 per cent.) has been recommended. A dilute solution of aluminium acetate is astringent and slightly antiseptic; Burow's preparation is a 5 per cent. solution of this chemical, and is too strong—it must be diluted ten times before application. Good results have been claimed also after application of dusting powders containing rhubarb or catechu, dermatol or aristol. I hold no particular brief for any of these applications, but think that healing may take place with any of them and many others. The chief point is to keep the surface of the ulcer clean and free from pressure. When the ulcer is quite clean the application of lotio rubra hastens healing.

In addition to local applications healing may be hastened by the use of artificial sunlight or ultra-violet rays to the part. When there is a large slough it may be advisable to cut it away, but that is about as much surgical intervention as is ever required.

ANTITOXINS FOR WAR EMERGENCY

MEDICAL RESEARCH COUNCIL'S PLANS

The fact has already been published that arrangements have been made by the Medical Research Council, at the request of H.M. Government, to provide tetanus antitoxin in sufficient quantity, and to ensure its continued supply in the event of war. Similar arrangements of more limited scope have been made in the case of gas-gangrene antitoxin. It is therefore thought that further particulars may be of interest, especially to medical officers who may be called upon to give instructions as to the use of these materials.

Provision of Tetanus Antitoxin

Tetanus antitoxin has been provided both for prophylactic and for therapeutic use. The prophylactic dose is 3,000 international units (= 1,500 American units) and is contained in a volume not exceeding 3 c.cm. During the early part of the war a dose of 500 American units was administered as a routine, and the dramatic effect on the case incidence of tetanus was very striking before the end of 1914. Although there was a great deal of evidence that a dose of 500 American units was highly effective, attempts were made during the later stages of the war to reduce still further the already low case incidence of tetanus by repeating the dose or increasing it[1]; and the tendency since the war has been to advocate the administration of 1,000, and, more recently, of 1,500 American units.[2] The dose to be administered for prophylaxis, in case tetanus antitoxin is again required, has accordingly been fixed at this higher level of 1,500 American units (= 3,000 inter-

[1] *Official History of the War*—"Medical Services Pathology," p. 164.
[2] *United States Pharmacopoeia*, 11, 61; *British Pharmacopoeia*, 1932, p. 62.

national units), though it can, of course, be increased or repeated if necessary. Provision has also been made for the treatment of cases of tetanus; the ampoules of concentrated antitoxin acquired for this purpose contain not less than 20,000 international units in a volume not exceeding 8 c.cm.

In order to avoid confusion it is necessary to express the strength of tetanus antitoxin both in international and in American units. The international unit adopted by the Permanent Commission on Biological Standardization is now used in many countries, including Great Britain, but the original American unit is still employed on the American continent and elsewhere. The relation between the two, however, is quite simple, one American unit being equal to two international units. References to other units formerly used occur in the literature: the old German unit, for instance, was equal to sixty-six American units.

Gas-gangrene Antitoxin

The provision of gas-gangrene antitoxin has proved a more difficult matter, due in large part to the lack of essential information upon which policy and action could be based, although there are other causes of difficulty. While it is generally recognized that early and adequate surgical treatment is by far the most important measure to be adopted, opinion is divided as to the value of antitoxin in the prophylaxis and treatment of gas-gangrene infections. It is generally agreed, however, that the proper use of gas-gangrene antitoxin is as an accessory to thorough surgical measures, and not as a substitute for these. Other difficulties in the way of making provision of antitoxin arise from the uncertainty as to the kind of pathogenic spore-bearing anaerobes likely to be encountered, whether the same infecting organism will predominate in urban and rural districts, whether the antitoxin should be given to all casualties or its use be restricted to the kind of injuries which, as the war experience showed, are particularly liable to become gangrenous. Further, little is known regarding the dosage appropriate for administration for prophylaxis and therapy. From inquiries made it appears that under ordinary conditions of civil life gas-gangrene cases are infrequent rather than common, and that infection, when it occurs, is due more often to the Welch bacillus than to other anaerobes such as *Vibrion septique* and *oedematiens*. It has therefore been concluded that it is unnecessary to provide antitoxin on a scale sufficient for prophylactic administration to all casualties.

Stocks of Welch, *Vibrion septique* and *oedematiens* antitoxins have been acquired which it is considered are adequate to meet the needs of the defence services and the civil population, both for prophylaxis and therapy. Modern preparations of gas-gangrene antitoxin are of higher potency than those used in the war, and the potency can be determined accurately and expressed in universally accepted international units. The arrangements which have been made allow for the administration of Welch, *Vibrion septique* and *oedematiens* antitoxin, either separately or combined, and an injection of one or more of these antitoxins combined with tetanus antitoxin could be given. As to dosage, the provisional proposal, which may have to be modified in the light of experience or to suit special circumstances, is to administer 3,000 units of Welch, 1,500 units of *Vibrion septique*, and 1,000 units of *oedematiens* antitoxin, respectively, as a combined injection for prophylaxis, the dose for treatment being two and a half times as large as the prophylactic dose. The arrangements made also permit of the injection of mixed antitoxins being replaced by a single antitoxin, either for prophylaxis in areas where experience suggests that this is warranted or for intensive specific serum therapy in cases in which the causal organism has been identified.

An international congress, organized by the International Federation and the Federation of Thermal, Climatic, Maritime, and Bathing Resorts of Belgium in conjunction with the Belgian Medical Society for Hydrology and Climatology, will be held at Liége from June 5 to June 10. All inquiries should be addressed to the Secrétariat Général des Assises, Rue Velbruck 4, Liége, Belgium.

Reports of Societies

OCULAR MANIFESTATIONS OF GENERAL DISEASE

At a meeting of the Medical Society of London on March 27 the subject for discussion was the ocular manifestations of general disease. Dr. C. E. LAKIN presided.

Derangements of Ocular Musculature

Professor EDWIN BRAMWELL opened by saying that medicine and ophthalmology touched at many points. A distinguished ophthalmologist told him that he taught his students that there were no eye diseases, but only ocular manifestations of general disease. From custom the eye was regarded as an organ for the reception of visual stimuli, and its importance in relation to expression had not received the attention it merited. Thoughts and emotions were expressed not only by speech but by a variety of voluntary and involuntary movements, which expressed the individual's state of health and his attitude towards himself and his environment. The ocular musculature was comparable to an elaborate instrument on the keyboard of which the mind and emotions were constantly playing. The function of the eyelids, Professor Bramwell continued, was protective; they also acted like the windscreen wiper of a motor-car. Tremor or flicker of the eyelids was a physical sign to which the clinicians attached a definite significance. The experienced physician might ask the patient to close his eyes in the course of his routine examination, but he did so in order to ascertain whether the lids were tremulous. Tremor of the lids when the eyes were lightly closed was an indication of an anxious temperament or at least of a temporary anxiety state. Typical flicker of the lids, often pronounced in cases of so-called traumatic neurasthenia, could not be effectively simulated. His impression was that tremor of the eyelids did not occur in cases of exophthalmic goitre. Excessive blinking—an involuntary action—might be due to irritation of the conjunctiva, but in some individuals it denoted a nervous temperament. An infrequent or diminished blinking rate was a striking feature of some cases of Parkinsonism. Tics or habit spasms affecting the general ocular muscles were not uncommon. A tic of the eyelids was often the sequel to a blepharospasm. The movements of the eyelids in cases of blepharospasm were made in order to remove the source of irritation or relieve the discomfort, but exceptionally the movements persisted after the irritating factor had disappeared. In the first instance purposeful, they now became purposeless. The reason why only a proportion of those affected with blepharospasm developed a tic was because the tic was a manifestation of abnormal mental make-up. There was always something wanting in the mentality of a "ticeur"; he might be brilliant and charming, but was often irresolute and wanting in perseverance.

Miner's Nystagmus

After touching on the manifestations of lethargic or epidemic encephalitis, and on the significance of the Argyll Robertson pupil, which he described as almost unknown apart from syphilis and certain tumours of the mid-brain, Professor Bramwell discussed miner's nystagmus, not because it was to be regarded as an ocular manifestation of general disease but because it was not. Personally he wished to see the term expunged from the medical vocabulary. Nystagmus was common in miners. Many miners were admitted to the medical wards of the Royal Infirmary, Edinburgh, from the coalfields of Fife and the Lothians, and he had repeatedly

found nystagmus, sometimes rotatory and pronounced, in miners who complained of no symptoms referable to the eyes. The miner who had nystagmus did not go sick because of nystagmus but because of an associated neurosis which he believed, or had been given to understand, was due to nystagmus. When a miner's neurosis was attributed to his nystagmus his attention was concentrated on the ocular defect. When a medical man attributed the neurosis to the nystagmus and certified a man as suffering from miner's nystagmus and as unfit for work he was fixing the neurosis to the nystagmus and perpetuating the neurosis. Miner's nystagmus was common in some pits where the illumination was good and relatively uncommon in others where it was not. It was the superadded neurosis which was of economic importance. The sooner the term "miner's nystagmus," as employed in its present sense, was abolished the better for all concerned. Two distinct conditions should be recognized—nystagmus in miners and neurosis in miners.

Proptosis and Retinal Haemorrhages

Mr. R. FOSTER MOORE devoted his remarks chiefly to the subjects of proptosis and of retinal haemorrhages. He did not believe that the stimulation of the sympathetic was the cause of the prominent eyes of Graves's disease. He believed a retracted lid indicated the start of that condition. While the exophthalmos might at first be unilateral it always affected both eyes later, and in his experience it never afterwards quite disappeared. He could not substantiate that statement positively, but he thought the eyes afterwards were more prominent in some degree than they would have been had the disease not occurred. Different theories had been put forward to account for the prominence, one being that it was due to vascular engorgement in the orbit comparable with engorgement of the gland. He believed the cause of the proptosis in Graves's disease to be an increase of orbital fat combined with oedema of the tissues. Sir Bernard Spilsbury had agreed with this view. It had been stated that the proptosis might develop quickly, even in a few minutes, but he was sure that if such cases were inquired into good grounds for scepticism as to its sudden development would be elicited.

In some general observations with regard to retinal haemorrhages Mr. Foster Moore said that these haemorrhages in themselves caused very little in the way of subjective symptoms unless they involved the macula. It was interesting to consider the fate of individual retinal haemorrhages. In the case of a bruise on the skin, changes of colour from purple to green and pale yellow occurred before it was finally absorbed, but no similar changes of colour occurred in retinal haemorrhages. Individual haemorrhages in the retina faded away without undergoing colour changes. A small haemorrhage might completely disappear in three or four days. He had also watched a number of gross haemorrhages slowly absorb, and at the end of many months there were still slight residues. It was worth remembering that at least 16 per cent. of the population had had haemorrhages in the retina, that being the proportion of infants who had retinal haemorrhages at birth. It was interesting to look at the fundus in a patient who was in the process of dying. The whiteness of the disk, the great reduction in size of the arteries, the breaking up of the blood column in the veins into little blocks swinging to and fro were very striking. Ultimately, owing to the opacity of the cornea, observations could no longer be made.

It was not possible to say in many cases whether the immediate cause of the escape of blood was in the endothelium or in the blood itself, but it seemed reasonable to suppose that in blood diseases it was the blood primarily that was at fault. He doubted whether a patient ever died of pernicious anaemia or leukaemia without haemorrhages appearing in the retina, and they were common in any form of secondary anaemia. Haemorrhages in arteriosclerosis were due to a fault in the endothelium and not to an increase of pressure in the vessels. Of sixty-six patients who attended an eye hospital for symptoms which on examination were found to be dependent on retinal arteriosclerosis, thirty-seven were known to be dead at the end of seven years, and of this number twenty-three had died of gross cerebral vascular lesions. The most conspicuous and reliable evidence of arteriosclerosis was to be looked for at the point of crossing of the retinal arteries over the veins.

Intracranial Tumours

Dr. ANTHONY FEILING, who presented some neurological considerations, said that it was well recognized that intracranial tumours were the most important single cause of papilloedema. This condition probably occurred in 80 per cent. of all cases of intracranial tumour at some time during its course. Subtentorial tumours, particularly tumours of the cerebellum, tended to produce an early and severe papilloedema, as did also tumours which blocked the Sylvian aqueduct. Discussion had often centred on the diagnostic value, if any, to be attached to an inequality in the degree of papilloedema in the two sides. Unless this inequality was well marked and capable of measurement in diopters of swelling it was doubtful if it had any localizing value. Every now and then cases would be met with in which a large tumour was present without any papilloedema at all. In many cases vision was retained to a remarkable extent, though sooner or later a secondary atrophy of the nerve fibres would occur unless the papilloedema could be relieved. The earliest change in vision might be a small enlargement of the blind spot.

The speaker also touched on what might be called toxic optic atrophy, which he said might occur from a large number of poisons. The most important of these was alcohol, especially methyl alcohol, responsible for so-called wood alcohol blindness. Others were arsenic, especially in the form of certain of the organic compounds, tobacco, carbon bisulphide, quinine, and quinidine. He had seen severe toxic amblyopia occur in a patient taking quinidine for auricular fibrillation. Acute retrobulbar neuritis of one eye arising without any obvious cause in a patient between the ages of 18 and 35 was much more likely to be due to disseminated sclerosis than to anything else, and this probability was much heightened if the patient was a female and if the loss of vision was not preceded or accompanied by much pain in the eye. An acute retrobulbar neuritis might arise from infection of the teeth, tonsils, or accessory sinuses, but he had yet to find a case in which he was really satisfied as to the causal connexion.

General Discussion

The PRESIDENT said that from time to time one saw patients who said that they had consulted an ophthalmic surgeon because there was something wrong with their eyes, and they were assured by him that there was nothing wrong, but that their sight would improve as their general health improved. He had often wondered what was wrapped up in that statement, and what the ophthalmic surgeon, if the onus was to be thrown on him, really meant. Mr. WILLIAM IBBOTSON mentioned one or two cases encountered surgically which had a bearing on the general subject. One was a case in which mastoid drainage was followed by paralysis of the external rectus on the same side, persisting for six months, but eventually clearing up without further treatment. Mr. F. A. WILLIAMSON-NOBLE referred to variations in the calibre of the artery in arteriosclerosis as described by various observers, and Dr. G. E. S. WARD mentioned the case of an elderly man in which, following cerebral thrombosis, serious haemorrhage had occurred in the eye, causing persisting 70 per cent. blindness. The patient was lost sight of, but presently reappeared with the story that the blindness had completely cleared up after another stroke.

Some discussion took place between Dr. FEILING and Professor BRAMWELL on the significance of the Argyll Robertson pupil. The latter said that all the four cases on which Argyll Robertson based his original description in 1868 as presenting pupils immobile to light while contracting to accommodation were also cases of miosis. That was a pure coincidence, these four cases having been sent to Argyll Robertson because he was known to be interested in the subject of miosis. Therefore he erroneously associated the miosis with these phenomena. He did not think that point had been brought out before, and it did not take away any of the credit which was rightly due to him for what he observed.

RECENT ADVANCES IN TREATMENT OF PNEUMONIA

At a meeting of the Section of Medicine of the Royal Society of Medicine on March 28, Dr. H. L. TIDY presiding, a discussion took place on recent advances in the treatment of pneumonia, with special reference to the use of M & B 693.

Dr. L. E. H. WHITBY said that from the experimental aspect the efficacy of this preparation in pneumococcal infections had been fully confirmed by *in vivo* experiments and by *in vitro* tests. The interpretation of *in vitro* tests called for caution because of the many factors which might modify the result, but the clinical reports from this country and from other parts of the world were now sufficient to show the value of M & B 693 in lobar pneumonia and to emphasize the advantage of a remedy which was not influenced by type and was effective even in the late stages of the disease. It appeared that provided the patient could live for twenty-four hours and could retain some 5 grammes of the drug the chance of a successful issue was greatly increased, irrespective of the day of the disease on which treatment was begun. The problems requiring urgent solution concerned the optimum total dosage and the spacing of doses, as well as a proper estimate of the efficacy of the drug in bacteriaemic cases and a critical inquiry into the reasons for individual failures. As to dosage, the scheme of Gaisford and Evans had been the one usually followed—namely, 4 to 5 grammes in the first twenty-four hours, and 3 grammes daily thereafter to a total dosage of 25 grammes. This had given good results, but it had not yet been established what was the minimum blood concentration required to effect cure. Animal experiments suggested that a sustained minimal concentration was more important than an intermittent maximal one. In animals the blood concentration required to deal with a small number of inoculated lethal doses was not much less than that required for a big inoculum. In clinical medicine, therefore, the drug, if used at all, should be used in full doses, irrespective of the severity of the clinical condition. The abandonment of the drug before a period of at least four days was always followed by an exacerbation which in animals it was difficult to control. High doses of the drug were not necessary to effect cure, and to increase the dose beyond a certain point did not necessarily increase the concentration.

The disadvantage of M & B 693 lay not in the rare serious complications—that is to say, serious blood changes—but in the gastric irritation and vomiting which occurred in some 30 per cent. of cases. With persistent treatment the vomiting often subsided, and there were numerous devices for overcoming this difficulty; intravenous saline was required in dehydrated patients. A search had been made for a soluble form of the drug suitable for intravenous, subcutaneous, and rectal administration, and such a form had received considerable experimental trial, and was in process of being assessed from the clinical aspect; it was rapidly absorbed and excreted. One might make the forecast that the action of the soluble sodium salt would consist of tiding the patient over the first twenty-four hours, the effect, if any, being followed up by the oral administration. It seemed unlikely that the soluble salt would entirely replace the tablets. The maintenance of an adequate blood level with the soluble preparation required to be most carefully controlled.

Serum Treatment

Dr. G. J. LANGLEY said that such contribution as he could make to the discussion concerned the results obtained by serum treatment given before the end of the third day of the disease in a uniform series of cases. The importance of uniformity in any large series of cases could hardly be overestimated. The whole of the cases on which he reported had been forthcoming from the working community of the city of Salford. All had been treated in the special wards of the municipal hospital, and the work had been done by three colleagues. The cases had been received from outside practitioners, and the proportion of cases admitted before the end of the third day of the disease argued a high degree of efficiency on their part. The cases taken had been limited to the ages between 16 and 60. Much effort had been expended in making the diagnosis of the disease as accurate as possible as regards both the disease itself and the causative organism. If the diagnosis was in doubt the results of treatment were in much greater doubt. The precautions taken had included a careful clinical history, repeated examinations by at least two observers, *x*-ray pictures of the chest, bacterial examination of the blood and sputum, typing of the organism, review of the whole case when terminated, and in the cases which had died post-mortem examination whenever possible. The treatment had been the administration of serum in large doses by the intravenous route to those patients who had been admitted before the end of the third day, and who showed the presence of the pneumococcus Type I or II. To form a control series the cases admitted after the third day had been taken, though he agreed that to a certain extent this upset the comparability of the statistics. The average duration of the disease on admission to hospital was 2.3 days for the serum-treated cases and 4.9 days for the others. The important part played by age in the outcome of pneumonia was widely recognized, and accordingly the figures had been divided into two groups according to age. The results were as follows:

Type	Age	With serum		Without serum	
		Recovered	Died	Recovered	Died
I	16–39	98	4	125	15
	40–60	33	6	57	12
II	16–39	46	3	44	6
	40–60	20	5	45	22

The earlier diagnosis of pneumonia was much easier in patients under 40 than in those over that age. The drug M & B 693 had been given only in cases of Types I and II admitted after the end of the third day and in Type III cases. The combined higher types had been found to constitute about 25 per cent. of the total cases of pneumonia. It had been shown in the past that an attack of pneumonia followed by recovery usually left the patient a carrier for about a month. Recovery of the type organism became more and more difficult with the lapse of time. He was anxious to know whether treatment by this drug had any effect on the recovery of the organism from the sputum. If the pneumococcus was caused to disappear bacteriological diagnosis became impossible, and in that situation they might find themselves desirous of withdrawing that old dictum, "Happy is the physician who sees his patients last."

Experience with M & B 693

Dr. W. F. GAISFORD reported results and clinical impressions after a year's experience in Birmingham with M & B 693. It was just a year ago that the first patient with pneumonia in his hospital was treated with this drug. Between 600 and 700 patients with respiratory infections

had now been treated, and of these the cases of lobar pneumonia numbered 400. No attempt had been made to divide the cases into mild and severe. Children under the age of 5 and patients dying within twelve hours after admission were not included in his statistics. During 1938 M & B 693 was not used as a routine throughout the hospital until August, and among the cases not treated by the drug up to that time the mortality was 23.6 per cent. The following figures furnished a comparison:

1936		1937		1938	
Not treated by M & B 693				Treated by M & B 693	
Cases	Deaths	Cases	Deaths	Cases	Deaths
415	93	461	100	400	26
Mortality per cent	22.4	21.7		6.5	

The effect of the drug on the temperature was shown in nearly all cases by a prompt fall to normal within forty-eight hours of starting treatment. So far as physical signs were concerned, he had not been able to determine any alteration of the rate of resolution; in fact, in some cases it seemed to have been delayed, though not to any marked extent.

The complications of the drug had only been minor ones. There had been no case of severe anaemia, and no evidence had been found of kidney or liver damage either during life or at necropsy. A number of rashes had been seen, similar in character to the sulphanilamide rash though less severe. Commonly the rash arose during treatment. It was independent of the amount of drug given, and disappeared in the course of a few days. Cyanosis was seen in some cases, but it had ceased to be a worrying sign. In babies and young children vomiting after taking the drug was practically non-existent. Such was not the case among adults; occasionally the vomiting was psychological, but more often it was dependent on the presence of gastritis, either due to infection or pre-existing. It was not due to variations in the tablets, as was at first thought might be the case. When vomiting did occur the next dose should be given by a different method. For example, if there was vomiting when the tablets were given whole they should be given on the next occasion crushed and suspended. Only rarely was vomiting so persistent that an insufficient amount of the drug was retained. The intramuscular route had proved highly satisfactory and free from reaction. Typing of the pneumococci from the sputum had been carried out in rather more than half the cases. He believed that M & B 693 represented a real advance in the treatment of lobar pneumonia. The improvement in results was comparable with that seen in streptococcal infections since the introduction of sulphanilamide; the drop in mortality had been maintained for a year, and the drug was almost completely non-toxic.

Combined Chemotherapeutic and Vaccine Treatment

Professor ALEXANDER FLEMING said that M & B 693, though it wrought a clinical cure, did not seem to kill the pneumococcus. Something else was required to kill the pneumococcus—namely, the natural defences of the body—and it seemed obvious, if that was true, that the better the defences the better the result. This 6 per cent. mortality in the treated cases might be reduced to vanishing point if the patient were immunized at the same time as the drug was given. The results on animals of combining small doses of M & B 693 or sulphanilamide with vaccine or serum treatment—that is, active or passive immunity—had been much better than those given by either the drug or the immunological method alone. The best way was to combine the two methods, which were not antagonistic but complementary. It would be interesting to see the effect of vaccine treatment plus the drug in patients with pneumonia. The disease was one in which there was not much time to develop active immunity, but it seemed from animal experiment that not very much active immunity was required when combined with drug treatment to determine a favourable result.

Another point was the possibility that the pneumococcus developed a fastness to the drug—in other words, became immune to M & B 693. Recently a medical officer sent to his department two cultures of pneumococcus. They were sent by air, and to his surprise arrived in a live state. They were cultures taken from a man with pneumonia Type I, the first before he was treated with M & B 693, and the second taken post mortem after he had had a good deal of the drug. The sensitivity of those two cultures to M & B 693 was tested, and an enormous difference was found. The first had about the average sensitivity of the pneumococcus, but the second—the one obtained post mortem—was the most resistant he had ever seen. That might be one explanation of why some cases did not respond to the drug.

General Discussion

Dr. H. S. BANKS said that his chief experience of the drug was concerned with meningococcal infections, but at the Park Hospital, London, during the last few months cases of pneumonia had been typed and treated with M & B 693. Something like thirty cases had been typed so far, practically all of them middle-aged persons, who might not be regarded as good lives, and there had not been a single death. There had been a fair proportion of cases of empyema in this small series. The soluble sodium salt had been found to be of great value in cases in which there was vomiting. He thought the toxicity of this form of the drug had been exaggerated. Lieutenant-Colonel C. H. BARBER said that he once had the opportunity of treating a small series of cases of lobar pneumonia with vaccines, and his impression was that the vaccines did a great deal of good. The cases were men whom he had just previously examined and found fit, but came in next day with lobar pneumonia. After injection with the Parke, Davis stock vaccine the temperatures went down to normal and the breathing became easier, and they went on to recovery, but resolution in these cases did not take place any sooner than might have been expected in the ordinary course.

Dr. MAURICE DAVIDSON uttered a note of warning. Sulphanilamides were being used by many of the junior members of the profession, and he could not but feel that as yet they were hardly in a position to say that these drugs did not cause damage. It seemed likely *a priori* that a drug sufficiently potent to deal effectively with a virulent organism must be capable of damaging possibly the renal epithelium or even the myocardium. Dr. ELI DAVIS mentioned a case treated at St. Stephen's L.C.C. Hospital, a child aged 16 months, who, after being given the drug, developed a scarlatiniform rash which spread over the whole body and rendered the child more critically ill than the original pneumonia. He wondered whether this experience was unusual, because Dr. Gaisford had said that his rashes were of a mild type. Gentian-violet 1 per cent. was the only preparation which had any effect ultimately on the rash.

The PRESIDENT (Dr. Tidy) said that Dr. Whitby had expressed some surprise that the necessary dosage did not vary in direct arithmetical progression with the number of organisms which were inoculated. But if the action of this drug depended on its concentration in the blood, surely that was what one would expect. The age factor in pneumonia was, of course, of great importance. There was a difference in the way in which pneumonia developed in people of 20 and in people of 50. In the older people there was usually considerable delay before one was certain that the condition was going to develop into clinical pneumonia. This would lead to delay in diagnosis. The condition now sometimes called pneumonitis had been recognized recently, and this might develop into lobar pneumonia. The question of empyema had been mentioned. If empyema was commoner in the cases treated by this drug it would be a point in support of Professor Fleming's contention for the use of vaccines. On the other hand, as clinicians they were not greatly interested in the question as to whether the drug killed the pneumococcus; the point was whether the patient was going to be cured. He thought they all recognized

the seriousness of the point to which Dr. Davidson had drawn attention—the possible damage done by these drugs. The "wild use" of these drugs in general practice was largely due to the travellers in drugs who went round visiting doctors. Nearly all cases were now receiving sulphonamide preparations in one form or another. They were undoubtedly given uselessly, and there were likely to be cases in which they were to some extent harmful. There was also the question whether they were likely to produce serious after-effects. But time had passed, and it did not appear that such conditions as agranulocytosis were likely to follow their use; in the cases of agranulocytosis reported there was obviously a constitutional tendency.

Dr. WHITBY, replying on the question of possible ill effects, said that there must have been tons of these drugs used (or abused) by now, but there had been no widely advertised coroners' inquests. It was known that the drugs were fully excreted within forty-eight hours of cessation of treatment, so that the occurrence of late complications was unlikely. Dr. GAISFORD, speaking of the incidence of empyema in the drug-treated series, said that at first he thought the incidence of empyema was higher, but actually this was not so. There were twenty cases of empyema in his 400 treated cases, and in the 461 cases that occurred the previous year and were not treated by the drug there were thirty cases of empyema.

THE EPIDEMIOLOGY OF JAUNDICE

At a meeting of the Section of Epidemiology of the Royal Society of Medicine, held on March 24, Dr. E. R. CULLINAN read a paper on "The Epidemiology of Jaundice." Dr. JOHN D. ROLLESTON was in the chair.

Dr. Cullinan began by saying that there were two forms of infective jaundice seen in this country—Weil's disease and common infective jaundice—the jaundice associated with other diseases such as pneumonia, typhoid, and paratyphoid infections not coming within the scope of the discussion.

Weil's Disease

Weil's disease had recently been recognized in this country but was still relatively uncommon. An account of the disease among miners in South Wales appeared in a recent issue of the *British Medical Journal*.[1] Up to the present time well under 200 cases had been reported in Great Britain, although there was evidence of past infection in more. Rats were almost always the direct or indirect source of infection in man. The excreted leptospira remained alive particularly in slime, but died quickly in an acid medium, strong sunlight, or in salt water. They entered the body through either cuts or scratches on the sodden skin, and also, some thought, through the upper respiratory tract or even the conjunctiva. These requirements narrowed down the incidence of the disease to certain particular occupations in which sewer-workers, fish-workers, and coal-miners headed the list.

The incubation period was usually seven to thirteen days, the mortality being in the region of 15 per cent. The need for early diagnosis should be stressed, as it was then that antiserum was of the greatest value. If, in addition to the classical symptoms of headache, severe muscle pains, nausea, vomiting, prostration, and fever, there was a history of likely occupation the disease should at once be suspected. It seemed unlikely that the particular occupational sites would be rid of rats, and the hope for the future prevention of the disease would largely depend on the development of prophylactic active immunization.

Common Infective Jaundice

Common infective jaundice was a frequent and widespread disorder. The causative agent was unknown; it appeared in epidemics, but cases apparently sporadic were also seen. As the clinical course was usually mild and the disorder not generally notifiable accounts were relatively few. Outbreaks were widely scattered, and had taken place at different times, but wherever it was seen it had the same essential clinical and epidemiological features, suggesting strongly that it was one disease process and probably had one specific cause.

The belief that the disease was one of rural areas, Dr. Cullinan thought, had risen simply because it was more easily seen and traced in small country villages, and he doubted the truth of this belief because plenty of cases were observed in London hospitals and schools. Outbreaks usually started between the months of August and March, and might continue throughout the year, although the incidence was less in the summer months. Epidemics involved communities of people who were in close contact, such as schools and families, particularly in children of the school ages of 6 to 10. Children of pre-school age were not exempt, and adults, particularly young adults, were by no means immune.

CLINICAL FEATURES

Common infective jaundice was much milder than Weil's disease and clinically distinct, but it should be remembered that a severe case of the milder disease might simulate a mild case of the more severe, and if there was the slightest doubt of the nature of an outbreak Weil's disease should be excluded as quickly as possible. The clinical features were remarkably constant, although the nature of the disease was usually not apparent until bile had appeared in the urine or jaundice was seen.

Frequently there was a prodromal stage of indefinite malaise from one to seven days before the onset of acute illness, which started usually with fever. The temperature might rise as high as 103° F., to fall again within the next day or two. The initial fever was seldom remarked, as the temperature was not often taken at the onset, the patient being described as having a "chill," or "huddled in front of the fire," but there were no rigors. Headache was frequent for the first two or three days, with occasional drowsiness; loss of appetite was complete, nausea common, and vomiting—often severe and intractable—characteristic though not invariable. Abdominal pain or discomfort was common, typically in the epigastrium and less often in the right upper quadrant of the abdomen. Jaundice appeared in anything up to twelve days from the acute onset, and was seen first in the conjunctivae and then in the face and neck. In mild cases it lasted only a few days, but in the more severe might persist for three weeks or more; its appearance usually coincided with the beginning of convalescence. During this stage the liver was frequently enlarged, and the speaker's impression was that the longer the jaundice lasted the greater the enlargement. In adults it was not unusual to find the liver extending down as much as three fingerbreadths below the right costal margin, although this was seldom found in children, in whom the disease was shorter. The urine contained bile pigments, and was dark one or two days before the jaundice appeared. Albumin was occasionally seen in the urine, particularly in the more severe cases; the bowels might be constipated or loose with offensive motions, stools being usually clay-coloured at some period of the illness but frequently containing bile when jaundice was established. In contradistinction to Weil's disease there was no leucocytosis and often a leucopenia with a relative or absolute increase in lymphocytes or monocytes or both. Of the other symptoms itching was uncommon, epistaxis rare, conjunctivitis seldom seen, urticaria occasionally described, and peeling had been observed in a few cases. Convalescence lasted from one to three weeks.

METHOD OF SPREAD

On studying the epidemics as a whole it could be said that the disease was not spread by water, milk, or food. It was quite clear that the spread was from person to person, and in a very large number of instances it was

[1] March 25, pp. 603, 605.

easy to trace the contact with others who had the disease or developed it shortly after. The contact was nearly always close.

The exact period of incubation was difficult to assess as the period of infectiousness was uncertain. An approximate time could be estimated by studying the early cases where contact was close, with members of the family sleeping together with little or no attempt at isolation. It was then seen that cases occurred either simultaneously or at spaced intervals of between twenty and forty days or, more probably, between twenty-one and thirty-five days. The actual period of infectiousness must be short, as was shown by the extraordinary periodicity in families and small villages where there was little isolation and cases occurred in series at an interval of about a month. It was probably quite safe to return children to school after two weeks. Many cases were missed; jaundice was found when looked for which would not have been identified as such in different circumstances. No causative agent had been discovered; leptospiral infection had been excluded. The disease could not be transmitted to ordinary laboratory animals, and these facts, together with the absence of leucocytosis, suggested that the disease might be due to a virus infection.

THE PATHOLOGICAL PROGRESS

The pathological process was probably a necrosis of the liver cells. Direct proof of this was difficult to obtain, as opportunities for post-mortem examination of undoubted and uncomplicated cases of common infective jaundice were rare. Recently the view propounded by Virchow that the disease was really due to obstruction of the mouth of the common bile duct had been revived by Hurst and Simpson. They divided it into two diseases: one, a true catarrhal jaundice due to temporary obstruction of the bile duct; and the other, a mild primary hepatic necrosis, it being considered there was clinical, biochemical, and histological evidence for this distinction. In true catarrhal jaundice there was initial gastritis with complete anorexia and nausea or vomiting, flatulence, epigastric discomfort and pain, sometimes diarrhoea, furred tongue, and slight fever, and the gall-bladder might be palpable when the patient was jaundiced. Cases of mild primary hepatic necrosis seldom showed pre-icteric symptoms of any kind, the onset of jaundice was accompanied by symptoms of toxaemia, and the liver was tender and slightly enlarged and the spleen palpable.

Certain drugs given in large doses were sometimes followed by jaundice and necrosis of the liver. An example was salvarsan and its derivatives used in the treatment of syphilis. It had been found that jaundice occurred seven and a half times more frequently in patients who had been given salvarsan than in those who had not. Sometimes the jaundice came soon after an injection, but was frequently delayed for a considerable time.

In conclusion, Dr. Cullinan spoke of the relation between common infective jaundice and jaundice following inoculation against yellow fever and measles. In 3,100 persons immunized against yellow fever with virus and homologous immune serum over a period of five years, eighty-nine cases of jaundice had been traced. The interval between the inoculation and the onset of jaundice varied from thirty-six days to just under seven months. The cases almost always tended to occur in groups in regional areas. Since another strain of the attenuated tissue culture virus had been used, however, no jaundice had occurred among the 2,500 people inoculated. A similar outbreak had been seen after inoculation against measles, where jaundice appeared from sixteen to one hundred days after the inoculation.

General Discussion

The CHAIRMAN said Dr. Cullinan had devoted most of his attention to non-spirochaetal jaundice. He personally was more interested in the spirochaetal jaundice which seemed to be prevalent in miners, sewer-workers, and fish-curers. It was important to realize that spirochaetal jaundice very often assumed different forms, many cases occurring without any jaundice at all. A country which suffered from the disease was Holland, where it was due to infection in swimming baths. Owing to the increase in Weil's disease it was a question whether active prophylaxis by serum and destruction of rats should not be carried out on a large scale. Dr. J. L. NEWMAN (medical officer of health, Chichester) gave some details of an epidemic of jaundice in Sussex. It started in Arundel and spread to the north of the county, later appearing in places on the coast. Two factors in this epidemic were interesting, as they seemed to prove in the one case a house-to-house spread and in another a carrier spread, though there was no way of proving this. Major BROWN touched on the question of conjunctivitis in jaundice. In an epidemic he investigated with Dr. Morgan he found it extremely common.

Dr. J. M. ALSTON said the prevention of Weil's disease interested him. Vaccination had been tried but was not very successful because of the severity of the reaction, and in this country, where the disease was not common, he thought the method undesirable for that reason. Dr. W. N. PICKLES corroborated the factor of close contact which Dr. Cullinan had mentioned, bedfellows seeming to carry infection to one another. He asked whether he had any view on the permanent damage to the liver. He had heard a suggestion that these patients were bad subjects for chloroform and evipan and might develop cirrhosis of the liver if they indulged in too much alcohol.

Dr. G. W. M. FINDLAY said it was obvious that they must know the actual aetiological agent, and evidence had been obtained to show that epidemic jaundice characterized by cholecystitis was caused by a virus. He was pleased to hear Dr. Cullinan say that the disease was contagious, because a few days ago in reading the correspondence between Pope Zacharias (741–752) and St. Boniface he found the former advising the latter, who had an epidemic of jaundice to deal with, to keep his patients isolated because the disease was undoubtedly contagious. Dr. HEALY of the L.C.C. gave some figures of the incidence of jaundice among school children, but he said that the results were as yet rather scanty. Over the period from November, 1937, to February, 1939, 193 cases were notified, 77 per cent. of which were associated with others. The period of absence from school averaged from two to four weeks.

Dr. CULLINAN, in reply, doubted whether an ordinary case did any permanent damage to the liver; it probably did a little, as was evidenced by the fact that the second attack was worse than the first.

PSYCHOLOGICAL FACTORS IN RHEUMATIC DISORDERS

At a meeting at the St. John Clinic and Institute of Physical Medicine, with Sir LEONARD HILL in the chair, Dr. PHILIP ELLMAN said that clinicians were frequently struck by the importance of emotional factors in determining, in particular, the response to treatment of patients with arthritic disorders, and it was this which had led Dr. Mitchell and himself, in 1932, to make some relevant investigations. Dr. S. D. MITCHELL said that a psychiatric study of the personalities of two groups of forty patients with rheumatoid and osteo-arthritis showed, particularly in the first group, an excess of patients of a personality type characterized by depressive features, by morbid anxiety, and by mild ideas of reference. He had been impressed by the frequency of emotional disturbance within one month of the onset of arthritic conditions. Such disturbances might easily act as precipitating factors.

Dr. A. T. M. WILSON said it was increasingly recognized that the adjective "organic" might refer to a secondary phase of disease which followed on primary disturbances which were purely physiological. Summarizing some preliminary observations made by Dr. Wittkower and himself, he pointed out that experimentally produced emotional states could be shown to affect the metabolic level, the extent of allergic reactions,

the development of immunity, the endocrine situation, the vasomotor and muscular tone. All these had been described as important factors in rheumatic disorders. After discussing investigations reported by various workers, he described briefly a few cases in which "fibrositis," although it probably had a local origin in vasomotor and spastic conditions of muscle, was almost certainly part of a psychoneurotic reaction to some gross environmental disturbance. This finding was borne out by the statement which had been made—that the total incapacity produced by "rheumatism" only exceeded that arising from tuberculosis in countries with State health insurance.

Local News

ENGLAND AND WALES

The Midwifery Service

The annual report of the Central Midwives Board for the year ended March 31, 1938 (H.M. Stationery Office, 4d.), shows that at the end of the period under review there were 67,089 women on the Midwives Roll for England and Wales, a net increase of 2,043 on the total for the previous year. As in the past few years, only a little more than a quarter of the total number of midwives on the Roll are actually engaged in the practice of their profession, the number practising in 1938 being 17,494. The number of candidates who entered for the midwifery examination was 4,420, which is the highest on record. Three out of every four candidates who sat for the examination were successful, the proportion varying to some extent in the different examination centres. The report sets out the arrangements made by the Board for the approval of institutions, lecturers, and teachers under the new training and examination rules, and it includes a detailed explanation of the rules made under the Midwives Act, 1936, requiring midwives to attend from time to time approved courses of instruction. Reference is made to the removal from the Midwives Roll of the names of 1,164 midwives who surrendered their certificates to local supervising authorities under the provisions of the Midwives Act, 1936. There has been a pronounced decline in the number of midwives dealt with annually by the Board under its penal powers; during the year under review only eleven charges were heard in respect of malpractice, negligence, or misconduct. Eighteen institutions were approved for the purpose of providing for midwives and pupil midwives the instruction in obstetric analgesia and in the use of an apparatus prescribed in the Board's ruling on the administration of nitrous oxide and air by midwives; the total number of institutions so approved on March 31, 1938, was thirty-two. The report also includes notes on decisions given during the year on midwifery etiquette and practice.

It was announced on April 1 that the Central Midwives Board has unanimously re-elected Sir Comyns Berkeley, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G., as its chairman for the year ending March 31, 1940.

Liverpool School of Tropical Medicine

The thirty-ninth annual report of the incorporated Liverpool School of Tropical Medicine (1937–8) records the deaths of Mr. T. Edward Lescher, who served on the council of the School as a representative of the Chamber of Commerce, and of the lecturer in entomology, Miss A. M. Evans, D.Sc. Following the resignation of Professor W. S. Patton owing to ill-health, Professor R. M. Gordon was appointed to the Dutton Memorial Chair of Entomology. During the year under review an insectarium was provided for this department, which should facilitate the rearing and maintenance of stocks of tropical parasites. Investigations along a new line opened up by the discovery of the guanidine compound synthalin, a powerful trypanocidal agent, have led to the discovery of several new substances which, while equal to synthalin in trypanocidal activity, are considerably less poisonous to the vertebrate host. One of these substances has been found to be also active in malarial infections of man. The re-establishment of the Imperial Garrison in Freetown, Sierra Leone, will probably further diminish in the near future the already restricted accommodation available for the Sir Alfred Lewis Jones Laboratory. At this institution research was continued regarding the forms of typhus encountered in West Africa. Other activities included an investigation into mosquito gauze suitable for screening houses, a mosquito survey of the Protectorate, and a study of a fungal disease affecting mosquitos, which proves fatal to a high proportion of larvae infected in nature. Should it be possible to culture this fungus under laboratory conditions, it is believed that it might be used as a biological means of mosquito control. The report states that the corrugated-iron roof of the animal house at Freetown was covered with light thatch at a cost of less than £2, with the result that the maximum temperature inside the building was reduced by 8° to 12° F., as compared with similar unthatched buildings.

Charterhouse Rheumatism Clinic

The new building of the Charterhouse Rheumatism Clinic in Weymouth Street was opened by the Duchess of Gloucester on March 29. Dr. H. Warren Crowe said that the clinic had been started with the idea that serious forms of rheumatism and arthritis should be treated at special centres. In the treatment of this condition a number of investigations were required: *x* rays, chemical and bacteriological analyses, and the services of specialists in various branches of medicine and dentistry. These things were expensive and out of reach except for the well-to-do; they had therefore conceived the idea of helping patients of small means to get such treatment by charging them small fees which just covered expenses. Up till now the clinic had been self-supporting, but they now needed £23,500 to complete the building, towards which they had collected close on £10,000 by private subscription. Mr. E. Hackforth, Controller of the Insurance Department of the Ministry of Health, said that they at the Ministry would watch with the greatest interest the progress of the work carried on at the clinic. He read a message from the Minister of Health in which Dr. Elliot said that he approved the new premises as an institution at which insured persons under the National Health Insurance Act would in future be able to obtain treatment for rheumatism as an additional benefit granted by their approved societies.

Notification of Puerperal Pyrexia: Correction

In the notes which appeared under this heading on page 690 of the last issue it was stated: "Unless the notifying medical practitioner holds a commission in His Majesty's Forces the local authority shall pay to him for the certificate a fee of one shilling, whether the case occurs in his private practice or not." The fee of one shilling mentioned here relates to notifications of puerperal pyrexia occurring in buildings in the occupation of any of His Majesty's Forces, or of any person employed by the Admiralty, the Army Council, or the Air Council. For other notifications of puerperal pyrexia the fees at present payable are to be continued—namely, a fee of 2s. 6d. to the notifying practitioner if the case occurs in his private practice, and a fee of 1s. if in his practice as medical officer of any public body or institution.

SCOTLAND

Finances of the Dundee Royal Infirmary

At the meeting of Dundee Royal Infirmary on March 13 it was intimated that the accounts for 1938 showed a deficit of over £15,000, and even after applying towards this the legacies and donations received in the course of the year there still remained a deficit of over £8,500. The chairman said that something drastic must be done to improve the financial position by increasing the revenue of the hospital. Efforts towards enrolling employee contributors had been so far successful that over 4,000 new weekly contributors had been obtained. A good deal of attention had been focused lately upon the nursing profession owing to the report recently issued by the Scottish Departmental Committee on Nursing Services. It appeared, however, to the directors that until the Government was prepared to assist the voluntary hospitals to carry out the suggestions of the committee the directors could only partially follow the recommendations. More nurses had been engaged and existing accommodation had been improved at a cost of £3,650. The directors had also decided to reorganize the medical electrical department at an estimated cost of £1,000, for which an anonymous gift of this amount had been received.

Edinburgh Dental School

At the annual meeting of the Edinburgh Dental Hospital and School Professor Sydney Smith, who presided, intimated that for the scheme of rebuilding this school they expected to secure £55,000, of which £18,000 had already been promised. The reconstruction was one of great importance for the whole health of the city, since increasing numbers of patients were applying for dental treatment, and opportunities for teaching and research in dental disorders were growing. The annual report showed that the total number of operations performed in the hospital during the past year had been 51,884, compared with 46,927 in 1937. The number of patients attending had been 35,603, as against 31,099 in the previous year. The total number of students on the roll of the school was 232, including nine women, and of these fifty-one students were taking a medical course as well as one in dentistry. It is expected that the work of demolition of the old building will take place during the summer vacation, and that thereafter the rebuilding will be completed in about two years.

AUSTRALIA

Royal Australasian College of Surgeons

The inaugural session of the twelfth annual general meeting of the Royal Australasian College of Surgeons (writes our correspondent in Victoria) was a brilliant function. It was held on the evening of March 15 in the noble Wilson Hall at the University of Melbourne. It was rendered notable by the presence of Sir Alfred Webb-Johnson, surgeon to H.M. Queen Mary, surgeon to the Middlesex Hospital, and a member of the Council of the Royal College of Surgeons of England. Distinguished surgeons from all parts of Australia and New Zealand attended, and the proceedings were officially opened by Sir Frederick Mann, the Lieutenant-Governor and Chief Justice of the State of Victoria. The Judiciary and the Bar, the University, the Services, the Churches, and the Federal and State Governments were represented, and with a large medical gathering, accompanied by many ladies, the audience formed a fitting one to appreciate the erudite address on "Surgery in England in the Making," which was the subject chosen by Sir Alfred Webb-Johnson for the Syme Oration, the central feature of the occasion. [An abstract of this oration appeared in the *British Medical Journal* of March 25 (p. 618).] After Sir Hugh Devine, the newly elected President of the Royal Australasian College of Surgeons, had invited him to do so the Chief Justice of Victoria declared the meeting open, and then Sir Alfred Webb-Johnson delivered the following personal message from Queen Mary:

"I have heard with much interest that Sir Alfred Webb-Johnson is travelling to Australia for the purpose of delivering the Syme Oration to the Royal Australasian College of Surgeons. I feel sure that visits of this nature must greatly facilitate the exchange of views and experiences and assist in promoting the cordial relations which already exist between the Royal Colleges of Surgeons of England and Australasia.

"I am asking him to convey my greetings to your President and Fellows, and everyone assembled at the meeting, and my best wishes for the continued success of your important work in the advancement of both science and surgery in Australia and New Zealand."

Sir Hugh Devine announced that a suitable cable would be sent to Queen Mary expressing the appreciation and loyalty of the Fellows of the College. He then delivered the Presidential Address, in which he welcomed Sir Alfred Webb-Johnson, to whom they were grateful for making the long journey to Australia to do honour to the first President of the Australasian College, the late Sir George Adlington Syme. Australia and New Zealand were countries which were distant from the big medical centres, and the Australasian constitution of the College would bring it into the world of international surgery, retain its Fellows within its fold, and keep them abreast of all advances in the art and science of surgery. The College was already after twelve years a body comprising 642 Fellows; its functions were purely scientific, and it was intended primarily to fashion highly skilled surgical healers for the benefit of the community. The Gordon Craig Memorial Library had been established as a lending library, which included a translation service of current surgical literature upon which they were prepared to spend £1,000 annually. Arrangements had been completed to share the management of the new Prince Henry Hospital in Melbourne, a section of which would be entrusted to the College for postgraduate teaching purposes. Sir Hugh Devine stated that the direct association of a College of Surgeons with a postgraduate teaching hospital would be unique, and must ultimately raise the local standard of surgery to a high level. He concluded his address by hailing with joy the advent of the sister college—the Royal Australasian College of Physicians—whose path in medicine would necessarily run parallel with that of their College in surgery.

ADMISSION OF FELLOWS

Sir Alan Newton, Vice-President and Censor-in-Chief, presented to the President a number of candidates, approved after examination by a Board of Censors of the College, for admission as Fellows in Surgery. The President then formally admitted as Fellows in Surgery the following surgeons:

Stanley Hains Lovell, M.S.Sydney; Roderick Hector Macdonald, M.S.Sydney; Edward Gerard MacMahon, F.R.C.S.Eng.; Alan Frank Hobbs, F.R.C.S.Eng.; Thomas Harry Ackland, M.D., M.S.Melb., F.R.C.S.Eng.; Leslie Westfield Gleadall, F.R.C.S.Eng.; Norman Marshall Harry, M.S.Melb., F.R.C.S.Eng.; Francis Joseph Hayden, F.R.C.S.Eng.; Bryan Tobyn Keon-Cohen, F.R.C.S.Eng.; Geoffrey Newman Morris, M.S.Melb., F.R.C.S.Eng.; Mervyn Henry Bowzer Robinson, F.R.C.S.Eng.; Eustace Alwynne Rowlands, F.R.C.S.Eng.; John Bowie Somerset, M.D.Melb., F.R.C.S.Eng.; and James Cuming Stewart, F.R.C.S.Eng.

George Alexander Brew, D.O.M.S.London, was similarly presented and admitted as a Fellow in Ophthalmology, and Hedley Francis Summons, D.L.O.Melb., and Heyworth Alexander Wigglesworth Watson, F.R.C.S.Eng., as Fellows in Laryngo-Otology.

Before he delivered the Syme Oration, Sir Alfred Webb-Johnson was presented by the Censor-in-Chief and admitted by the President as an Honorary Fellow of the

Royal Australasian College of Surgeons and acknowledged the honour most graciously. It is unnecessary to inform his colleagues in England of the details of the Syme Oration, which, as would be expected, displayed a wonderful fund of scholarly knowledge and was delivered with elegant grace and many touches of dignified humour, which held the interest of the audience and aroused its admiration. In response to the expression of thanks by the President Sir Alfred Webb-Johnson made a number of handsome gifts to the Australasian College. Sidney Young's *Annals of the Barber Surgeons,* and South's *Craft of Surgery,* edited by Sir D'Arcy Power, were brought by Sir Alfred as a gift from the chairman of the publishing company, Lord Ebbisham, one time Lord Mayor of London. A volume prepared by Sir William MacCormac to celebrate the centenary of the Royal College of Surgeons of England was presented by Sir William MacCormac to Sir Cuthbert Wallace, who had sent it in the care of Sir Alfred Webb-Johnson for presentation to the College. Sir Alfred himself gave the College three volumes of the writings of Sir Charles Bell, the founder of the Medical School of the Middlesex Hospital, and capped this generosity by presenting a portrait of the late Lord Lister, copied by Francis E. Hodge from the portrait by W. W. Ouless hanging at the Royal College of Surgeons of England.

Leprosy in Queensland

The annual report for 1937–8 on the health and medical services of the State of Queensland includes, among less common features, accounts of leprosy and leptospirosis (with a separate section on *L. pomona*) and further investigations on "Q" fever. Points from a survey of leprosy in Queensland during 1900–30 are that: (1) age extremes were 7 and 92 years; (2) child leprosy has increased, indicating its endemicity; (3) the number of coloured lepers detected has much increased (since 1930), and (4) latterly (1935–6) a greater number of white people were admitted to Peel Island; (5) of 126 first admissions to the latter (1925–37) thirty-four died. The probable place of infection in 129 cases (fifty-eight whites, seventy-one aboriginals) occurring during 1925–38 has been mapped out, and study of the natural history of the disease is proceeding in a closed aboriginal community in North Queensland; each member of families yielding suspects or proved cases is examined every three months. Apparently early cases may be bacteriologically negative, and the methylene-blue diagnostic test was disappointing, perhaps due to the predominance of neural types of leprosy. Further work on "Q" fever has shown that the known endemic centres are located in an area with an annual rainfall greater than 50 inches; infected bandicoots have been caught (in some antibodies have been demonstrated), and four other bush animals and the cow and dog have been found susceptible, but a parasitic vector has not yet been traced. Agglutinin examination of abattoir workers showed that infection may occur without clinical signs. Investigation of leptospirosis throughout Queensland demonstrated at least four serological strains of leptospira, but classical Weil's disease is rare. Another type, *L. pomona,* induces immunity in guinea-pigs for about one year, probably for a longer period in human beings.

The fifth International Exhibition of Cripples' Work will be held in London in October, 1939, under the auspices of the Central Council for the Care of Cripples, 34, Eccleston Square, S.W.1. Work done by crippled persons in workshops, hospital schools, training colleges, and home industries will be displayed and will be eligible for competition for diplomas and trophies. Applications for stand space should be made before May 1. The Queen and Queen Mary have promised to visit the exhibition if their engagements permit.

Correspondence

Storage of Radium in War-time

SIR,—Radium is not only a valuable but also a very dangerous substance. If, during an air raid, any quantity of radium was dispersed by violence, the buildings in which it was dispersed, as well as a considerable area surrounding the buildings, would be for many years to come a menace to any people who inhabited them. One-hundredth of a milligramme would probably be fatal if inhaled.

It is therefore necessary that steps should be taken to provide for the safe custody of radium in war-time, and a conference has been held between representatives of the British *X*-Ray and Radium Protection Committee, King Edward's Hospital Fund for London, the Ministry of Health, and the National Radium Commission to consider this matter.

The National Radium Commission is compiling a register of owners and holders of radium, with a view to satisfactory arrangements being made. The Commission earnestly requests all persons who have radium in their custody or possession (including the responsible official of institutions holding radium) to notify the Commission, stating the amount of radium held.—I am, etc.,

GEORGE F. STEBBING, M.B., F.R.C.S.,
Secretary, National Radium Commission.

18, Park Crescent, Portland Place,
London, W.1, March 31.

Nomenclature of the Malarial Parasites

SIR,—In the past, following the teaching of F. Mesnil, we have used the name *Plasmodium praecox* Grassi and Feletti, 1890, to designate the parasite of malignant tertian malaria, and we have given our reasons for this choice (*Arch. Inst. Past. Alger.*, 1929, **7**, 223). These were based upon a study of the original documents, and especially on papers very kindly lent to us by Mlle. Isabella Grassi.

In their recent study of the nomenclature of the parasite of malignant tertian malaria Sir Rickard Christophers and Lieutenant-Colonel J. A. Sinton (*Journal,* December 3, 1938, p. 1130) have pointed out the difference between the specific nomenclature *de jure* and *de facto* of this plasmodium. They have, however, emphasized with justification the fact that a strict application of the rules of nomenclature would lead to almost intolerable confusion in malarial literature. We are in agreement with them, and consider that for convenience in practice and to ensure uniformity it is necessary to adopt for all three species of human plasmodia the names now in most common use, even if they do not conform strictly with the nomenclature *de jure*. The names which should be used for the parasites responsible for the three common fevers are:

Plasmodium vivax Grassi and Feletti, 1890. (The parasite of benign tertian malaria.)

Plasmodium malariae Grassi and Feletti, 1890. (The parasite of quartan malaria.)

Plasmodium falciparum Welch, 1897. (The parasite of malignant tertian malaria.)

In consequence, and also to ensure the same clarity of nomenclature in future, it is desirable that the specific name *praecox* should be abandoned as the designation of the first avian plasmodium described by Grassi and Feletti. This parasite ought, therefore, to be called *Plasmodium relictum* Grassi and Feletti, 1891, as was

done by Laveran and by many other workers after his time. The specific name *praecox* for a plasmodium is therefore a *nomen nudum*.—We are, etc.,

ED. SERGENT. ET. SERGENT.
L. PARROT. A. CATANEI.

The Pasteur Institute, Algeria, Algiers, March 28.

Pruritus and Psychology

SIR,—The need for systematic instruction in clinical psychology still calls for occasional emphasis, and I trust that I may be forgiven if I criticize, from the point of view of the psychotherapist, Mr. Lawrence Abel's surgically unimpeachable article on pruritus ani in the *Journal* of March 25 (p. 627). The group, among causes, of "functional (that is, hysterical or psychological)" leaves us guessing whether "hysterical" and "psychological" are mutually inclusive or exclusive, and except as a piece of jargon "functional" might as well be left out. Why not indicate what we mean and say "psychogenic"? The heading "Psychological Causes" is noteworthy in that it is not followed by any indication of causes except the ubiquitous "worry" and the unhelpful statement "it would appear that many cases of the more serious types of pruritus are entirely due to an abnormal mental make-up." What is this "make-up"? Signs of it are given—"loss of corneal reflex, anaesthesia of the palate, patchy anaesthesia of the face and legs"—but these were blown upon by Babinski thirty years ago and belong rather to witchcraft than to modern medicine. Has Mr. Abel ever tried to find out whether the corneal or palatal reflex is any different in those with one mental make-up from what it is in those with another? And can he, as a scientific man with a training in physiology, tell us why an abnormal mental make-up should coexist with a patchy anaesthesia of the face and legs, even if he has evidence that it does?

What has he to offer for the unfortunate people whose trouble is entirely due to this make-up? The only hint is that "the mere prick with a needle appears often to improve the patient's psychology, and this is obscure inasmuch as psychology is not a mental state but a science like physiology or palaeontology, so that unless the patient happens to be studying it there does not seem much to be gained by the prick. This criticism can only be negative. Active opposition to the teaching of clinical psychology has now ceased, but specialists in other subjects still write as if, they knowing nothing of this one, it follows that there is nothing to know.—I am, etc.,

London, W.1, March 30. MILLAIS CULPIN.

Tumours in Twins

SIR,—I am making an analysis of records of tumours in twins and would be glad if you could give me assistance by publishing this appeal for information to the medical profession of England.

A number of records have been published of tumours occurring in one or both members of a pair of twins. There is a divergence of opinion as to the conclusions which can be drawn from such reports. I am therefore asking all members of the profession who have had occasion to diagnose or treat tumours, either benign or malignant, in either *one* or *both* members of a pair of twins to communicate with me, giving the following information so far as possible:

Twin 1.—Name. Sex. Tumour? Site. Type. Age of onset. Age at death. Age if still living. Was there operative or pathological confirmation of the diagnosis?
Twin 2.—Same information.

If the twins were of the same sex, were they so similar in appearance as to cause confusion in identity, or were they dissimilar?

Those cases in which one twin only was affected are just as important as those in which both twins have the tumour. The names are important, but will be kept confidential, because if the same person were treated by several doctors, all of whom were to send in information, the name would aid in checking the fact that there was duplication. The ages when the tumour arose and the ages of death or at which the twins are still living are of great importance also. If the tumour began in Twin 1 six months ago and Twin 2 has not yet shown it the short duration of time must be considered in evaluating the record. But if the second twin has lived twenty years without developing the tumour that point should be noted. Because there are not many available records of tumours in twins, I appeal to all members of the profession who read this note to send to me as soon as possible any data which they have on tumours in twins.—I am, etc.,

MADGE THURLOW MACKLIN, M.D., LL.D.,
Assistant Professor of Histology and Embryology, Medical School, University of Western Ontario.

London, Ontario, Canada, March 22.

Chemotherapy for Pneumonia

SIR,—I am indebted to Dr. R. A. Shawyer for his letter on the dosage of M & B 693 (*Journal*, March 25, p. 643), but I am not convinced.

In a streptococcal infection I fully appreciate the importance of large initial doses, for so often this infection becomes a conflagration out of all control; but I have always regarded primary lobar pneumonia as a disease which leads to spontaneous recovery if the respiratory distress and the cardiac embarrassment can be contended with until that moment when the patient's antibodies can deal with the disease. We still sometimes see a crisis.

The pneumococcus toxin, I believe, stimulates the respiratory centre, and one of the first effects of M & B 693, I think, is to diminish the frequency of respiration, and if by moderate doses we can do this and ensure a smooth passage for the patient why insist on larger or heroic doses? In the two cases I described I found one tablet every four hours (but not waking the patient during the night) sufficient to relieve symptoms.

Dr. Shawyer enumerates the toxic effects of the drug and admits that pleural effusion is more common in cases treated with large doses of M & B 693. I have heard of a case of pulmonary oedema as a sequel which ended fatally. I do not think it unreasonable to suppose that the risk of such complications may be reduced by a moderate dose sufficient to relieve symptoms of distress and allow the patient's own defences a larger share in the conflict. After all, if pusillanimity is cowardly, who is the hero when magnanimity produces catastrophe—doctor or patient?—I am, etc.,

Tarrington, March 28. H. G. LANGDALE-SMITH.

SIR,—I read with interest of the treatment of pneumonia with M & B 693, but was much disappointed that no dose was recorded by Dr. H. G. Langdale-Smith (*Journal*, March 11, p. 506). This is a common failing in medical journals, and also medical books. Surely in the case of these new drugs that are constantly appearing the dose should be stated always, as all doctors cannot be very familiar with them. Dr. R. A. Shawyer's protest about the matter (March 25, p. 644) is the first I have seen. His idea of giving the amount for adults, children, and infants is excellent, especially as the dose per stone is greater for

children and infants than per stone for adults. The want of such information makes an article or book useless. There are many doctors who are not able to attend postgraduate courses; therefore medical authors should be as helpful as possible, even at the risk of repeating what has already appeared many times in print.—I am, etc.,

Surrey, March 28. R. M. RUSSELL.

Chemotherapy in Tuberculosis

SIR,—It was interesting to see in Dr. J. H. Crawford's paper (*Journal*, March 25, p. 608) that even in the presence of tuberculosis M & B 693 exercised a favourable, if not decisive, influence on the course of pneumococcal pneumonia. I would like to record my own experiences with sulphonamide in pulmonary tuberculosis.

A woman of 45, who has had the disease for about ten years with occasional exacerbations, and whose lungs are now both heavily involved, recently developed a continued pyrexia with profuse sputum, night sweats, and rapid wasting. Her husband appealed to me to make a special effort to prevent what looked like the inevitable outcome, and I decided to try out the new chemotherapy—I had seen no reference to its use in the literature. Accordingly she took one 7½-grain tablet four times a day for one week. The effect was immediate. Her temperature began to fall at once, and by the end of the week was normal. She was now feeling a little uncomfortable from the side-effects of the drug, so that it was stopped for a week. At the end of this time her temperature, which had originally been in the region of 100° to 101° F., had risen again to 99° to 100° F. Again the drug was started at the same dosage, and the effect was the same. This time we have continued for a fortnight, and at the beginning of the second week her temperature fell to 97° F., where it remained. This is the stage we are at now, and I have again stopped the exhibition of the drug for a week. Next week I propose to give her M & B 693 to see if that will help at all. During this time her sputum has decreased in volume to about half, but I cannot say that her lung sounds are in any way improved.

It has generally been accepted that some of the later symptoms of advanced tuberculosis are due to secondary invading organisms and not to the tubercle bacillus itself, and so what I think must have happened, in the absence of bacteriological proof, is that I have disposed of a lot of these by chemotherapy. It is too much to hope that the effect can be anything but temporary, but if ever she seems likely to be overwhelmed in this way again I shall look to chemotherapy to help her to come back to the best sort of health which she can expect.—I am, etc.,

Essex, March 27. W. H. M. WILSON.

Gonococcal Proctitis treated with M & B 693

SIR,—A voluminous literature has grown up on the sulphanilamide therapy of gonococcal infections, but cursory examination of the material does not show cases of primary rectal infection in the male treated by such therapy. The following case may be of interest.

I was consulted by a man aged 24 complaining of pain in the rectum. He had already consulted a doctor, who gave him suppositories, which had no effect. Ten days previously he had had rectal intercourse with another male, and after three days pain and tenesmus set in with the passage of what he called pus and mucus. Defaecation became very painful, and, feeling ill, he took to his bed. On examination the genitals were normal. There was no urethral discharge and no history of venereal disease. Digital examination of the rectum was painful, the sphincter being in spasm. Proctoscopy was done with difficulty after the application of percainal ointment. On the posterior rectal wall, about two inches within the anal margin, was an area of yellow muco-pus, and beneath this a round shallow ulcer three-quarters of an inch in diameter. This showed intense inflammation, but there was no bleeding. Examination of the pus and smears from the ulcer showed large numbers of pus cells and Gram-negative intracellular diplococci.

The manipulation did not cause urethral discharge. The patient was given M & B 693: six tablets a day for four days, followed by four tablets a day for four days, and then two tablets a day for a further week. No local treatment was given. After a week of drug treatment gonococcal vaccine was given and continued for a month. Improvement began within one day of starting the drug treatment. Three days later the ulcer was freely bleeding, and smears could not be obtained. The pain and tenderness had almost gone. In a further three days the ulcer had quite healed, but its site could still be made out; smears showed neither pus cells nor gonococci. The pain had completely gone, defaecation was easy, and the patient stated that he had not felt so well for months.

Weekly smears were taken for a month and remained negative. Six weeks after the drug treatment had begun a gonococcal complement-fixation test, rectal smears, and a provocative injection of 750 million gonococci all gave negative results. The rectum was normal, with no sign of ulcer or stricture. The above tests for cure were repeated at the end of another month, and were still negative.

The interest in this case lies in the fact that the results of treatment are similar to those obtained in genital infection. The drug produced no toxic symptoms at all, and treatment was begun when the disease had been present for more than a week; this seems to be the best time to commence drug therapy in gonorrhoea.—I am, etc.,

London, W.C.1, March 31. EDWARD T. RENBOM, M.D.

Toxicity of M & B 693

SIR,—The annotation entitled "Sulfapyridine" in your issue of March 25 (p. 623) contains a reference to Marshall's experimental findings as to the toxicity of M & B 693 which calls for some comment, since the conclusion is drawn that "they [Marshall's experiments] must be held to supersede English results, which are undoubtedly vitiated by failure to take into account the factor of incomplete absorption." Marshall's experiments were carried out on the sodium salt of M & B 693. This preparation is very soluble in water and strongly alkaline in reaction (*p*H approximately 11.5). The disadvantages and possible advantages of this preparation were known to us long before the publication of Marshall's results, and we are still engaged on the study of the toxicity, dosage, and possible methods of administration of this salt. We must emphasize also that administration of the drug in this form has not so far been advocated in this country, although the experimental work, both biological and clinical, in progress suggests that under certain restricted conditions the use of the preparation may in some circumstances be advantageous.

M & B 693 was issued for clinical trial after Whitby's work had shown its efficacy in the treatment of mice infected with multiple (from 10,000 to 50,000) lethal doses of virulent strains of pneumococci of various types. These results were obtained in all cases by oral administration of the original drug, which is only sparingly soluble in water. Clinical use by the same route was thus clearly indicated, and experiments on the toxicity of the drug were therefore, in the first place, confined to studying the effect of the drug when administered orally. Experiments on these lines on mice, rats, rabbits, cats, and dogs showed that oral administration produced no untoward results with either small or massive doses, singly or repeatedly, over a period of weeks. We may add that since the unrestricted issue of the drug to the profession we have superimposed on a strict chemical control a biological

assay for toxicity in mice at a standard oral dosage of 15 mg./gramme (15 grammes/kilo), the average weight of the mice employed being 20 grammes. This has involved the use of approximately 650 mice, in which the mortality rate has been 5.6 per cent.

We are well aware that when large doses are administered absorption is by no means complete. Experiments on the absorption and excretion of the drug have been in progress for some time past, and a paper on the subject is now in the press. That some variation of absorption occurs is true, and in this connexion it may be pointed out that Marshall has himself recorded variations in the absorption of sulphanilamide in man (*J. Amer. med. Ass.*, 1937, **108**, 905). Nevertheless, Whitby's experiments showed a degree of uniformity of the protective action of the drug remarkable in a biological assay of this kind. In a series of thirty experiments involving some 200 mice an average survival rate of treated mice of 6.5 days (maximum observed 7 days) was obtained. In twenty-seven (90 per cent.) of these experiments the variation was between 6 and 7, and in the remaining three (10 per cent.) the figure obtained did not fall below 5.5 days. With smaller doses than that required to produce this effect the survival rate was correspondingly lower. It appeared, therefore, that absorption in mice was at any rate sufficient to be uniformly effective, and to some extent depended on the dose employed. From these data the dosage for oral administration to man was evolved, and clinical results bear witness to the undoubted effectiveness of the drug under these conditions and to its freedom from serious toxic effects.

Much remains to be done before an adequate knowledge of the behaviour of the drug in the body is obtained, but to suggest, as Marshall does, that because oral administration of the very soluble sodium salt produces acute toxic effects the original sparingly soluble drug is itself capable of producing such effects leaves out of account the fact that this sparing solubility of the drug is its own safeguard. Determinations of the concentration in the blood stream after oral administration of the original drug show that under these conditions a dangerously high concentration cannot be obtained; this cannot be said of the oral administration of the sodium salt. That the levels reached with the original drug are effective is shown, as we have said, by the clinical results.

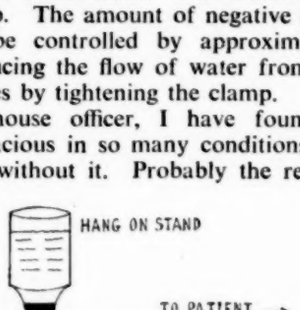
Indiscriminate use of the drug is to be deplored, but nevertheless the activity of the drug against organisms other than pneumococci must be acknowledged if Whitby's original experiments, which have since been confirmed by Fleming's *in vitro* work (*Lancet*, 1938, **2**, 74), are accepted. In the initial phases of an acute infection it is virtually impossible, except in hospital practice, to obtain a rapid and accurate bacteriological diagnosis. M & B 693, by reason of its wide range of activity, is at present, therefore, the most suitable drug for empirical use in clinically probable acute coccal infections.—I am, etc.,

A. J. EWINS,
Director of Research,
Research Laboratories, May and Baker, Ltd.
Dagenham, March 31.

Acute Dilatation of the Stomach

SIR,—Mr. Hamilton Bailey's paper on acute dilatation of the stomach (*Journal*, March 4, p. 434) was excellent so far as it went. But it has occurred to me that this facile author of so many excellent books on surgical problems may have overlooked the important contributions of Professor Wangensteen on this and allied subjects. The easiest and most efficient way to empty the stomach, and keep it empty, is by the use of continuous suction, as advocated by Wangensteen. This procedure requires no more than three bottles—two of one gallon and one rather smaller—a few feet of rubber tubing, an adjustable clamp, and some water. The crude drawing shows how it is set up. The amount of negative pressure in the stomach can be controlled by approximating the two bottles, or reducing the flow of water from the upper to the lower bottles by tightening the clamp.

As a late house officer, I have found this simple apparatus efficacious in so many conditions that I would hesitate to do without it. Probably the results are most



dramatic in acute dilatation of the stomach and paralytic ileus after extensive abdominal procedures, and where peritonitis exists. Most peptic ulcers causing obstruction through a combination of fibrosis and spasm will clear up, temporarily at least, if the stomach is kept empty by this means. As Mr. Bailey suggests, it allows patients to take water much sooner after abdominal surgery than formerly, although objections could be raised that this was a form of refined deceit. I have induced a few of my chiefs to allow me to pass a nasal tube into the stomach, and then pass it through the gastrojejunostomy stoma, and have been convinced that tension on the suture line was relieved. The method seemed to have some virtue in persistent hiccup and hyperemesis gravidarum. I have also used a modification for facilitating drainage from enterostomies, caecostomies, colostomies, and even after "closed" empyema procedures.

The cautions are few: supply at least as much fluid and salt as you remove, usually parenterally; change the tube every twenty-four hours, because the constant pressure of the tube causes ulceration in the inferior meatus of the nose, with possible epistaxis. The judicious use of a spray of 5 per cent. cocaine or 2 per cent. butyn often makes the procedure easier if the gag reflex is active. And if the nasal septum is badly deviated there is scarcely any less advantage in passing the tube by mouth.—I am, etc.,

Long Island, U.S.A., March 14. A. M. WIESEN.

Three-phase Modified Bendien Reaction

SIR,—The recent paper by Dr. C. H. G. Price (*Journal*, March 18, p. 551) on this subject re-echoes the interest that has been shown during the past six years in what I have preferred to call the colloidal vanadium reaction, or, for brevity, the C.V.R. His findings emphasize, perhaps more strongly than in the experience of others, the disappointment that the reaction has not proved specific for clinical cancer. Elsewhere I have admitted this, but have also expressed the realization that clinical cancer—that is, the presence of an actual development of carcino-

matous cells—is a comparatively late manifestation of a preceding abnormal condition of malignancy, which must have existed to allow of those pathological changes in previously normal tissue cells which result in clinical cancer.

The colloidal alterations in the albumin–globulin and cholesterol–lecithin ratios particularly are not likely in themselves to be causal factors of such pathological processes, but may be utilized as in the C.V.R. to indicate the presence within the subject of a derangement of the normal enzymic control of tissue metabolism. This is perhaps another method of expressing the findings of the late Shaw Mackenzie's extensive research in that direction. Designating it the "differential sedimentation test," Dr. Harry Coke (March 25, p. 644) has employed the C.V.R. more extensively than others, and suggested several clinical interpretations of its use, to which he briefly refers. It was found comparatively early in the more general employment of this test that various clinical allergic conditions were usually associated with a positive or "malignant" type of reaction. This apparent confusion becomes less marked when it is appreciated that cancer may be considered as the response to an allergy of mitosis. The three main functions of life are to eat, to work, and to reproduce; in the cell these are expressed as metabolic secretion, contraction, and mitotic cell division. When a sensitizing stimulation affects a cell it may produce a hyperergic response in any of those functions, resulting in allergic hypersecretion (asthma, urticaria, etc.), hypercontraction (fibrosis, etc.), or hypermitosis (neoplasia). It therefore may explain why a similar abnormal metabolism is associated with such apparently dissimilar clinical conditions as asthma, osteo-arthritis, and cancer, each of which may show a "malignant" type of serum C.V.R., the clinical entity depending upon whether it be the secretory, contractive, or mitotic functions of the cells concerned which respond to the allergic stimulation, and this according to geneticists is determined by the presence or absence of intracellular gene controls.

When a specific test for clinical cancer is found it will probably be of the nature of a complement-fixation reaction, employing cancer tissue, extract, or some constituent of or like it, as an antigen. Several attempts in this direction have been made but without much success. It appears probable that the future elucidation of precancerous malignant derangements of normal cell function will result from more extensive haematological and serological research, especially including the endocrine factors, which normally maintain so uniform a concentration of serum constituents but allow of such definite variations under certain pathological conditions.

In spite of the C.V.R. not providing a more specific test for clinical cancer it has given a means of obtaining valuable information in many obscure clinical conditions, and it is hoped at a later date to present the result of such "follow-up" observations collected during the last six years from a large number of cases.—I am, etc.,

Liverpool, March 30. E. CRONIN LOWE.

Weil's Disease

SIR,—As contractors for many years for the repair and maintenance of the London sewers we read Dr. R. D. Stuart's article in your issue of February 18 (p. 324) with interest.

The incidence of Weil's disease among men employed in sewers has given us great concern, and, in conjunction with the London County Council, we have taken such measures as were within our power to prevent or reduce the possibility of infection among these men.

These steps have taken the form of:

1. The spraying of walls of sewers with a solution of sodium hypochlorite, especially where cutting away of brickwork, etc., is necessary.

2. The provision of an antiseptic and carbolic soap for washing of hands.

3. An adequate supply of first-aid requisites, including particularly antiseptic, gauze, and adhesive plaster for dealing with cuts or abrasions.

4. Keeping the gangers and workmen impressed with the necessity for prompt treatment of cuts, however trivial.

5. The issue of cards to all men with (*a*) instructions against risk of leptospiral jaundice, (*b*) information for medical practitioners.

6. The notification to head office of every sewerman absent so that inquiries may be made. If on account of illness, his doctor is called upon and warned of the possibilities of the disease.

Regarding 5 (*b*), in view of the number of fatalities in recent years we thought it desirable to give on the card a brief note of the symptoms of the disease drawn up by a well-known medical authority. It is within our experience that a number of general medical practitioners are unable to identify leptospirosis owing to the likeness, in its early stages, to influenza, pneumonia, etc. Hence our instruction to all our sewer workers that whenever they are taken ill they should let their doctor know of their occupation and draw attention to the information on the card. Each reported case is followed up from time to time by further inquiry of the doctor attending the case, with the object of ensuring that suspect cases are dealt with immediately by blood test or otherwise.

While it is not in our province to compare the medical histories or treatment mentioned by Dr. Stuart, we felt the methods we have adopted in London may prove useful in other towns where Weil's disease is known or supposed to exist, and we should be only too pleased to place our experience at the disposal of others.—I am, etc.,

GEORGE M. BURT,
Director, John Mowlem and Co. Ltd.

London, S.W.1, March 30.

Election to Council of Royal College of Surgeons

SIR,—Eleven years ago there was some correspondence in your columns on the above topic as to the undesirability of canvassing by a friend for a candidate up for election to the Council of the Royal College of Surgeons of England. Whether indirect canvassing is desirable or not is debatable; but I think that nearly everyone will agree that direct and indiscriminate canvassing by a candidate for himself is undignified and objectionable. Such an innovation has occurred this year, and it is to be hoped that it will not be regarded in the future as a precedent to be followed. One of the fourteen candidates for the election in July has written a personal letter to the Fellows of the College in this neighbourhood, appealing for their support, although he is personally not known by them. Such a display of misguided energy should defeat its own object. I imagine that the natural reaction to the receipt of such a letter would be to abstain from voting for the candidate who wrote it.—I am, etc.,

Norwich, April 2. A. J. BLAXLAND.

On March 29 the Earl of Athlone, as president of the National Hospital for Nervous Diseases, Queen Square, London, formally accepted the Associated British Cinemas Laboratory for biochemical research and the Gaumont-British Laboratory for histological research. He said that the National Hospital was under a deep obligation to Associated British Cinemas and to Gaumont-British for consenting to show its appeal film in a large number of their theatres and for permitting collections to be made, which had brought in £18,360. In this way there had been made possible the two laboratories, which materially assisted in completing the research department of the hospital.

Obituary

E. P. CUMBERBATCH, B.M., F.R.C.P.

Medical Officer in Charge of the Electrotherapeutic Department, St. Bartholomew's Hospital

By the death on March 24 of Dr. Elkin Percy Cumberbatch at the age of 58 St. Bartholomew's Hospital loses a fine teacher who was himself a pioneer and inspired others to become later in their turn eminent in the branch of medicine towards the creation of which he had contributed so much. His career was brilliant from its start. He held a senior foundation scholarship at St. Paul's School, and left it in 1899 with a senior exhibition in science to enter Keble College, Oxford, with an open scholarship in science. He graduated B.A. in 1903, with first-class honours in the School of Natural Science, and entered St. Bartholomew's with a senior university scholarship, having already won the Welsh Memorial Prize at Oxford. Five years later he graduated M.A., B.M., B.Ch. A tradition was already being created at St. Bartholomew's by his cousin, A. E. Cumberbatch, F.R.C.S., who had been aural surgeon since 1882, after serving for many years as demonstrator of anatomy; in spite of great difficulties due to the nearness of the old surgery, the traffic of Smithfield, and grievous lack of space, he was bringing into existence a school of practical otology. After passing the final medical examinations, E. P. Cumberbatch became house-physician at St. Bartholomew's in 1910; he had spent the previous year as house-surgeon to the Dorset County Hospital. He took the M.R.C.P. in 1911, and was elected a Fellow in 1933. He was examiner in medical electrology for the Cambridge D.M.R.E. in 1921–3 and 1927–33. In earlier years at St. Bartholomew's Hospital H. Lewis Jones and W. E. Steavenson were engaged in the pioneer work which has been described as having "elevated medical electricity in England from scientific empiricism to a recognized branch of medicine." These two physicians were followed by Hugh Walsham and E. P. Cumberbatch, and it has been recorded that diathermy, ionization, treatment by sinusoidal currents, and the "condenser method" of testing reactions were first practised in England in the old electrical department at Bart's, which was developing under Dr. Lewis Jones, the "father of medical electricity." When Cumberbatch succeeded Walsham he brought skill and initiative into a field in which his predecessors had already achieved so much. He was president of the Section of Electrotherapeutics of the Royal Society of Medicine in the year 1921–2, president of the Section of Electrology at the Bilingual Congress held in London in 1922, and president of the Section of Electrotherapeutics at the sixth International Congress of Physical Medicine in 1936.

A member of the British Medical Association since 1911, Cumberbatch was secretary of the Section of Electrotherapeutics at the Annual Meeting at Cambridge in 1920, vice-president of the Section of Radiology at Glasgow in 1922, and vice-president of the Section of Physical Medicine at the Centenary Meeting in London in 1932. He was a member of the conference in 1933–4 which dealt with the training and recognition of balneological assistants, and served on the Physical Medicine Group Committee from 1933 to 1937.

Dr. Alastair MacGregor writes:

The unexpected death of Dr. E. P. Cumberbatch has removed from our midst one who could be ill spared, and has created a great void among the ranks of scientific electrotherapists which will be hard to fill. Many years ago, when already recognized by the authorities in Great Britain as a leader in his special branch of medicine, he attained an international reputation after the publication of his two standard works, *Essentials of Medical Electricity* and *Diathermy*, both of which have passed into several editions. I first met Cumberbatch in the early days of his career, in 1913, and soon struck up a friendship with him. This friendship was further cemented when, in the following year, I was appointed chief assistant in the electrical department at St. Bartholomew's, a post which I held for seventeen years. I soon found out that his reserved manner could not conceal a delightful personality with a clever and versatile brain and high ideals of his profession. He was a brilliant conversationalist with a keen sense of humour, often expressing itself in anecdotes of his school, Oxford, and Bart's days. One envied his wonderful memory when he recited screeds of Latin, Greek, and English poetry, grave and gay, and long quotations from Dickens and other authors. He was not only a master of his special subject but was a fine teacher of it. His lectures to the candidates for the Cambridge D.M.R.E. who came to Bart's were models of what lectures should be—clear, concise, delivered in perfect English enlivened at intervals with flashes of humour; the most difficult points explained either by diagrams or by homely similes which made them patent to the meanest capacity. He was always most painstaking in his examination of hospital patients, and treated the poorest of them with the same kindness and courtesy which he would extend to the most affluent of his private patients. All the years during which I was working with Cumberbatch I have rarely or never seen him ruffled or impatient, except when he was talking about any practitioner who had done something unprofessional, especially if it savoured of quackery, that quackery from which his eminent predecessor, Dr. Lewis Jones, and he had done so much to emancipate medical electricity. He was ever a seeker after the truth, and would examine every new theory or suggested method of treatment from every point of view before making a decision; and I do not remember him ever making a statement which he had afterwards to retract. Many will remember Cumberbatch in after-years as a great master and teacher of medical electricity. I shall, moreover, ever keep a spot of memory green for a great man whose unbroken friendship, through weal and woe, I enjoyed for twenty-six years, and from whom I received many acts of kindness.

R. S. PATERSON, M.D., D.M.R.E.

Senior Honorary Radiologist, Manchester Royal Infirmary

We announce with regret the death on March 30, at the age of 45, of Ronald Simpson Paterson. His illness had lasted only a few months.

Dr. Paterson, though a comparatively young man, had attained a distinguished position in the profession. He graduated M.B., Ch.B. at Manchester in 1917, having previously acted as resident house-physician and house-surgeon in the Royal Infirmary, for during the war he was among the senior students who were selected for this work. Thus early in his career did Dr. Paterson give evidence of his qualities of common sense and reliability. Immediately after qualification he joined the R.A.M.C., and served in France until the end of the war. After demobilization he turned at once to radiology. A love of photography, in which from early boyhood he had excelled, a remarkable mechanical aptitude, and a strong scientific bent combined perhaps to attract him to this

branch of his profession, and indeed proved of the utmost value to him. But he was quick to realize that this comparatively new specialty had before it a great field of clinical usefulness and of scientific opportunity, extending far beyond its purely mechanical side.

He took the Cambridge diploma in radiology in 1920, and after a further period of residence, in the Barnes Convalescent Hospital, he was appointed registrar in the radiological department of the Manchester Royal Infirmary. Here he studied under Dr. A. E. Barclay and Dr. J. M. Woodburn Morison. Thanks to these able teachers he forged ahead rapidly. The Royal Infirmary in Manchester was a pioneer in the development of the large, highly organized *x*-ray department, and Paterson, who had a remarkable gift for organization, made a special study of administrative problems, which was soon to stand him in good stead. When Dr. Morison was appointed radiologist to the Edinburgh Royal Infirmary in 1925 Paterson, who had joined his seniors in private practice, became assistant honorary radiologist; and when in 1928 Dr. Barclay resigned to take up his teaching appointment at Cambridge, Paterson, then in his early thirties, took upon his shoulders as honorary radiologist the responsibility for this rapidly expanding service. A little earlier a thesis on epiphyseal development had won him the M.D. of his university.

During the ensuing years Paterson developed the department with conspicuous success. A capacity for quick decision and a clear insight into practical problems enabled him to anticipate and to provide for the rapidly increasing demands for *x*-ray facilities, and to solve all administrative difficulties as they occurred. His ability was recognized not only in his own hospital, where he became chairman of the Medical Board in 1936, but also outside its walls. He was appointed lecturer in radiological anatomy to the University, and was an external examiner in radiology for the Universities of London and Liverpool. A gift for leadership and an unusually sound judgment marked him out for distinction among his colleagues. He found time to attend regularly the council of the British Institute of Radiology and the monthly scientific meetings in London, which he rarely missed. He became president of the Section of Radiology of the Royal Society of Medicine, and was also a vice-president of the Section of Radiology and Radiotherapeutics at the Annual Meeting of the British Medical Association in 1929.

Paterson had long advocated the formation of a new radiological body, of purely medical membership, to advance the status of his specialty and to help in its organization. He took an active part in the foundation of the British Association of Radiologists—now the Faculty of Radiologists—of which he was a founder-member, fellow, and second president. He had the gratification of seeing this body take shape, acquire the status for which its founders had worked, and grow into an examining body which grants the highest radiological qualification in this country. His presidential addresses in his section at the Royal Society of Medicine and as president of the British Association of Radiologists contributed in no small measure to the success of this project, for Paterson, though no visionary, had clear vision, which he concentrated upon those ideas which were capable of realization. His imagination, working always upon this framework of realism, was a potent force for progress. His influence was great, and was reinforced by an eminently lovable personality, which brought him a host of friends and bound closely to him those who worked beside him.

He had abundant energy, a great fund of human and kindly wit, a cheerful and happy disposition, and a fair and generous outlook. He delighted in mechanical problems and in the neat use of his hands. He was a craftsman of no mean order, a keen fisherman, a lover of gardens and of Nature. It is typical of him that, himself a brilliant organizer, he detested the bureaucratic spirit; himself a scientist, he felt there was little room for the "pure scientist" in medicine. His personal attitude to any scientific method was determined by its effect upon, and its value to, the patient. His human sympathies were deep and sincere. His untimely death is a great loss to his profession. By all who knew him he will be remembered as an outstanding personality and a cherished friend.

Dr. GEORGE MACDONALD of Cefn Mawr, Wrexham, who died on March 10 at the age of 74 while in the course of his professional visits, had been a member of the British Medical Association for nearly half a century. He received his education in Aberdeen, where he graduated M.B., C.M. in 1888. More than fifty years ago he joined a medical partnership in Cefn Mawr, and subsequently extended it widely, becoming a well-known and very popular general practitioner in the neighbourhood, to which he devoted the whole of his energy and enthusiasm. He was a member of the Panel Committee for Denbighshire and of the Wrexham and Derhurst Medical Society. He interested himself in various local industries and undertakings, and was highly esteemed by his professional colleagues and many personal friends. He is survived by his widow and his son, Dr. Alec MacDonald, who was accompanying his father on his last professional round.

Dr. ROBERT MCMILLAN BOWMAN of Bangor, Co. Down, who died on March 16, was a well-known and much-respected figure in medical and public life in his native town. Dr. Bowman was the only son of the late James Bowman, who was for some years chairman of the Bangor Town Commissioners and of the Bangor Urban Council. His grandfather was a member of the Town Commissioners from 1864 to 1880. He himself was elected alderman in 1931, and there was thus a continuity of family service to Bangor for nearly eighty years. In his early life Dr. Bowman sailed before the mast and had the experience of rounding Cape Horn in a windjammer. He followed a business career before medicine attracted him; he then became a student at Edinburgh University, where he graduated M.B., B.Ch. in the early days of the war. His love of the sea determined his entry into the Navy on active service, in which he did useful service in the Dover Patrol and in the operations at Zeebrugge. When he retired from the Navy he had reached the rank of surgeon commander. After a period of study in London Dr. Bowman returned to his native town of Bangor and began practice there in 1926. His maturity of judgment and his experience of life made him a successful practitioner and assured him of a place in the affection and esteem of his patients. His sound professional knowledge attracted to him many patients, to all of whom he gave of his ability and physical strength, sacrificing his leisure for those who placed their trust in him. His vision was broad, his outlook clear, and his appreciation of his daily problems was always sound. The many calls upon his time as a medical practitioner did not preclude his interest in other affairs. He was a staunch member of the British Medical Association and a Fellow of the Ulster Medical Society. Sport in all forms attracted him, so that there was not a single sporting activity—football, golf, swimming, sailing, or bowling—which did not benefit by his patronage and help. In 1937 he was elected Mayor of Bangor. For some weeks past his health had not been satisfactory, but it was hoped that a period of rest would restore him to his usual vigour. Unfortunately this was not to be. Dr. Bowman leaves a widow and two sons, the elder of whom has been associated with his father in practice.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Sir Edward Mellanby, K.C.B., M.D., F.R.S., Secretary of the Medical Research Council, will deliver the Rede Lecture on Friday, April 28, at 5 p.m. in the Regent House. His subject is "Some Social and Economic Implications of the Recent Advances in Medical Science."

The Faculty Board of Medicine has appointed E. B. Verney, M.A., to be a member of the M.D. Committee for the year 1939, in place of Dr. T. H. Hele, resigned.

O. M. Solandt, M.D.Toronto, has been appointed University Lecturer in Mammalian Physiology for three years from April 1.

At the Congregation held on March 17 the degree of M.Chir. was conferred on D. B. McGavin, whose initials were incorrectly stated in our issue of March 25 (p. 654).

UNIVERSITY OF LONDON

London Hospital Medical College

The two open scholarships, each of the value of £100, have been awarded to the following candidates for the forthcoming academic year: (1) Mr. R. G. White, Queen's College, Oxford. (2) Mr. R. G. Ladkin, Exeter College, Oxford, and Mr. J. Waterlow, Trinity College, Cambridge (equal, scholarship divided).

The following candidates have been approved at the examination indicated:

Academic Postgraduate Diploma in Medical Radiology.—*Part I:* S. H. Ali, G. W. Boden, M. L. Mundy, M. Nasiruddin, Peggy C. Permain, N. Sacks.

UNIVERSITY OF ABERDEEN

At a graduation ceremony held on March 29 the following degrees were conferred:

LL.D.—James McIntosh, M.D., Director of the Bland-Sutton Institute of Pathology, Middlesex Hospital.

D.P.H.—J. Leiper, N. A. Ross, Marie S. Sutherland.

UNIVERSITY OF GLASGOW

At a graduation ceremonial to be held on Wednesday, June 21, the honorary degree of LL.D. will be conferred on O. H. Mavor, M.D. (the well-known playwright "James Bridie"), and G. Grey Turner, M.S., F.R.C.S., professor of surgery in the University of London.

UNIVERSITY OF DUBLIN

The University of Dublin (Trinity College) has appointed as Lecturer in Psychological Medicine Edward Armstrong Bennet, *M.C.*, M.D., D.P.M., who will visit Dublin during each summer term to give his courses of lectures.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

Surgery.—D. E. Harken, A. N. Kalra, S. Smith, A. B. Taylor.

Medicine.—T. Bliss, G. R. Green, D. E. Harken, H. Woolwich.

Forensic Medicine.—T. Bliss, G. R. Green, D. E. Harken, H. Woolwich.

Midwifery.—R. M. J. Franks, T. L. B. Iredale, G. L. L. Reynolds, R. G. Ticehurst, M. Whitehead.

The diploma of the Society has been granted to G. R. Green, D. E. Harken, A. B. Taylor, R. G. Ticehurst, and M. Whitehead.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

The following candidates have passed the examination for the diploma of the College:

F. S. Bonugli, A. Buchan, J. W. Brown, Violet Conway, J. G. B. DeVine, N. Dodd, Mary N. Fawcett, R. Edwards G. H. Ellidge, J. E. Elliott, J. F. Fraser, Audrey I. Freeth, E. G. Collins, Evelyn W. Glennie, A. Grant, D. H. Harrison, R. L. Hartley, D. W. Hendry, Eugenie C. Illingworth, J. Kay, R. F. Lawrence, J. T. Mair, Mary D. Mellersh, G. Mitchell, I. H. C. Morton, R. Pollok, Florence G. Richards, R. Roaf, Ada M. Sewell, Helen Thomson.

Medical Notes in Parliament

Before rising for the Easter adjournment both Houses of Parliament this week discussed foreign policy. The business of the House of Commons also included the second reading of the Civil Defence Bill.

The Royal Assent was given on March 29 to the Cancer Act.

Sir Francis Fremantle presided on March 29 at a meeting of the Conservative Health and Housing Committee, which was addressed by Dame Ellen Musson and Dame Joanna Cruickshank. Their subject was the report of the Departmental Committee on the Nursing Services, with special reference to the proposed creation of a second grade of nurses.

Sir Francis Fremantle has given notice that on going into committee of supply he will call attention to the nursing services, and will move "that the House, taking note of the report of the Interdepartmental Committee on Nursing Services, recognizes the inadequate supply of nurses to meet the increasing demand for their services and the urgent need of reform in their training, registration, and conditions of service both for institutional and domiciliary nursing."

Progress of Bills

The Camps Bill and the Disused Burial Grounds Bill were read a second time in the House of Commons on March 29.

On March 30 in the House of Commons the Marriage (Scotland) Bill and the Local Government Amendment (Scotland) Bill were read a second time. The Census of Production Bill was read a third time.

On March 31 the House of Commons gave third readings to the Army and Air Force Annual Bill and the Local Government Superannuation Bill.

CRIMINAL JUSTICE BILL

ABOLITION OF CORPORAL PUNISHMENT

The Criminal Justice Bill was further considered by a standing committee in the House of Commons on March 14, when a beginning was made with the discussion of Clause 32 (Abolition of power to pass a sentence of corporal punishment). The chairman, Major Lloyd George, intimated that he was prepared to allow a general discussion of the clause on the first amendment, which was by Mr. Spens. Sir Samuel Hoare said corporal punishment for the young was becoming obsolete. It was no longer used in London, nor in many of the principal cities of this country. In 1917 there were 5,210 sentences of corporal punishment upon boys under the age of 14, whereas in 1938 only forty-seven such sentences were inflicted on boys under this age. There had been inquiries in two cities into the subsequent records of boys upon whom corporal punishment had been inflicted. Three out of four of these boys were again charged in the police court with serious offences within three years.

The question of corporal punishment of adults was more difficult. As long ago as 1861 the abolition of corporal punishment was carried by Parliament, but as a result of public indignation a number of statutes subsequently reimposed this penalty. It had been imposed for a list of horrible crimes, greater knowledge of which had shown that the perpetrators were pathological and better dealt with by other measures. The records showed that sentences without flogging in the case of robbery with violence were as efficacious as sentences with flogging. He explained the proposal to retain flogging for mutiny and for attacks upon warders in prison. Outside prison there were effective deterrents without corporal punishment; inside those deterrents did not exist, though the punishment of flogging was seldom inflicted, and a year might go by without a single such sentence.

Sir Archibald Southby advocated the retention of flogging, and said he believed it was the only thing that would deter the drug peddler.

The debate was continued on March 16, when Mr. BENSON approved the abolition of birching for juveniles. Juvenile delinquency was, he said, a phase which many children passed through, and they grew out of it; it was a social nuisance but not a social danger. With adult offenders the use of the "cat" over a period of seventy-five years had produced no effect which was traceable.

Sir ERNEST GRAHAM-LITTLE said that persons who enjoyed inflicting pain themselves most feared pain. Corporal punishment would deter and correct that type of person. He hoped the clause would be omitted.

SOLICITOR-GENERAL'S VIEW

Sir TERENCE O'CONNOR said powerful arguments were necessary to justify in the twentieth century the flogging of one adult by another. The normal reaction of a child at the spectacle of the infliction of pain was horror or fright, and therefore damage. All human beings suffered exactly the same damage as a child did when it saw punishment unless what was done could be supported by the processes of reason. Could their reason at present justify the infliction of a form of torture by one human being on another as a method of treatment or a deterrent against the recommission of crime? Was flogging the only available deterrent? Sweden, France, Hungary, Italy, Belgium, Czecho-Slovakia, Portugal, Germany, and forty States of the American Union were controlled without corporal punishment. Under the present Act of 1898 the only things which could be punished by flogging in prison were mutiny, attempts at mutiny, and gross violence on the officers or servants of the prison. Because Parliament gave power to impose corporal punishment on prisoners in certain exceptional cases, that did not mean that the Home Office could not use other deterrents. Apart from this, he contended that no reasons had been advanced to justify the continuance of the comparatively useless and archaic method of punishment by flogging.

A MEDICAL OPINION

The discussion concluded on March 21. Sir FRANCIS FREMANTLE said he had done his best to acquaint himself with the feelings of the medical profession on the subject. He could not find that there was any definite opinion which generally covered the medical profession, though most medical men would take the line that they sympathized with the general idea of this Bill—namely, to promote correction and improvement rather than punishment as such. He had been in touch with seven bodies concerned with medico-psychological work. Only one favoured abolition of corporal punishment; the other six did not mention the subject, from which he gathered that medical psychologists were largely divided on the subject. It was true that flogging, when it was inflicted on sensitive persons, had a bad effect, but the Bill was going a long way towards dealing with the psychological side so that the corporal punishment would not be inflicted, or inflicted only in a light way, on the prisoner who was likely to be affected because of his nervous temperament. He desired to see the power to flog retained on the Statute Book.

Sir DONALD SOMERVELL said that the advocacy of flogging as a deterrent did not accord with the principles on which penal reform in this country had proceeded. It was common ground that the "cat" was not a reformative instrument. In 1843 the Criminal Commissioners said of whipping: "It is a punishment which is uncertain in point of severity, which inflicts an ignominious and indelible disgrace on the offender, and tends, we believe, to render him callous and greatly to obstruct his return to any honest course of life." That view was accepted by the House of Commons in 1861. There were possibilities of mistakes, and the Departmental Committee's report referred to a case in which an adult who received the "cat" was afterwards found to have been certifiable at the time.

After further debate on March 21 Mr. Spens withdrew his amendment and Clause 32 abolishing flogging was approved by thirty-two to seventeen.

SUITABILITY FOR PREVENTIVE DETENTION

Further consideration was given to the Criminal Justice Bill by a standing committee of the House of Commons on March 28. On Clause 37 (Duty to consider reports of Prison Commissioners) Mr. BENSON took exception to the clause which permits an examination and report by the Prison Commissioners on the physical and mental condition of the offender and his suitability for a sentence of corrective training or preventive detention. He said the clause asked for a medical examination which was unnecessary. Mr. GEOFFREY LLOYD said the examination would be a safeguard of substance in regard to preventive detention. There was an element of corrective training even in preventive detention, and a certain percentage of successes even there. Therefore the mental condition was relevant even in such cases.

The clause was then agreed to and amendments were made on the motion of Sir TERENCE O'CONNOR in Clause 38 (Power to remand for inquiry into mental condition). Sir Terence explained that his first amendment was to make clear that the conditions of cognizance were to include the institutional place at which, or the medical practitioner by whom, the examination was to be carried out. Mr. RHYS DAVIES raised the question of the fees to be paid to the medical profession for this work. He remarked that under the factory law there was a scale of charges, and doctors were paid accordingly. Sir TERENCE O'CONNOR said it was intended the scale of fees should be discussed with the medical profession. Mr. RHYS DAVIES presumed that the Government would accept the scale set down by the British Medical Association. Sir SAMUEL HOARE: Oh, no.

The Committee agreed to the amendment, as also to subsequent amendments moved by Sir Terence. The latter explained that Subsection (4) of the clause provided for the payment of certain expenses where the person concerned had entered into the cognizances requiring him to undergo a medical examination at the institution and approved by the Home Secretary. Mr. RHYS DAVIES hoped that in negotiating with the British Medical Association the Home Secretary would bear in mind that some of the people who would undergo medical examination would be insured under the national health scheme and that the doctor concerned would receive payment already in respect of that person. Sir SAMUEL HOARE said he would give that point attention.

FEES FOR MEDICAL EXAMINATION

Sir TERENCE O'CONNOR then moved a longer amendment setting out under different heads the sums payable in respect of travelling expenses of the offender, fees for the medical examination and report and for the purpose of evidence by the doctor who made the examination, and expenses of maintenance of the offender in an institution for the purpose of medical examination. He said the amendment differed from the printed Bill in making specific provision for the payment of sums required for the giving of evidence by the medical profession. It would ensure that the practitioner was not paid twice for costs under the Costs in Criminal Cases Act, 1908. The committee agreed to this amendment and to another which Sir Terence said was put forward under excessive caution. He explained that institutions within the meaning of the Mental Deficiency Acts were intended for persons who were certified to be mentally defective, whereas under the clause it was contemplated that people should be remanded to see whether or not they were mentally defective. It was therefore necessary to make express provision authorizing those institutions to take in such persons. The second part of the amendment arose from the fact that certain provisions of the Lunacy Act, 1890, related to licensed houses and registered hospitals. One section of the Act made it an offence to receive any person beyond the numbers specified in the licence, and the committee therefore must make provisions that persons admitted under the Bill should be reckoned as patients for the purposes of that Act. The clause as amended was then added to the Bill.

On Clause 39 (Power to make reception orders) Sir TERENCE O'CONNOR moved an amendment which he said was a substantial redraft of the whole clause. As the clause stood, the Court could take certain steps on the certificate of two medical practitioners. The Government had now come to the conclusion that a court of summary jurisdiction should not

be empowered to order the detention of an offender of unsound mind merely on the certificates of two doctors. The amendment proposed that the medical practitioners should give evidence as to the grounds on which they formed their opinion. It required that, before taking action under the clause, the court must satisfy itself that the person was a proper person to be detained. Obviously it was not every person of unsound mind who came before the courts who was a person proper to be detained. This amendment and others to the same clause concerning reception orders were agreed to, and the clause as amended was ordered to stand part of the Bill. Further consideration of the Bill was then adjourned until April 4.

Medical News

A reception will be held at the Royal Society of Medicine (1, Wimpole Street, W.) on Tuesday, April 25, at 8.30 p.m., when Fellows and their friends will be received in the library by the President and Lady Ball. At 9.15 p.m. Dr. Philip Gosse will give a lecture on "St. Helena."

A meeting in support of the work of the Empire Rheumatism Council will be held at the Mansion House on Tuesday, April 25, at 3.30 p.m., and will be addressed by the President, H.R.H. the Duke of Gloucester, who has written a letter to Lord Horder expressing the hope that the meeting will help to awaken the community to the need for grappling vigorously with the scourge of rheumatic disease.

A meeting of the British Institute of Radiology will be held at 32, Welbeck Street, W., on Thursday, April 20, at 8 p.m., when Dr. G. B. Bush will read a paper on "Seriescopy: Its Principles and Applications."

Discussions on "The Hospital Services," to be opened by Dr. James Grant and Dr. Margaret B. Herbst, and on "Hygiene in Factories," to be opened by Mr. R. W. Wilkinson, will take place at a meeting of the Royal Sanitary Institute at Greenesfield Health Centre, Mulgrave Terrace, Gateshead, on Friday, April 14, at 5 p.m.

Among the chairmen of committees presented to the King and Queen during their recent visit to the National Institute for the Blind, Great Portland Street, London, were Sir Humphry Rolleston, chairman of the Medical Advisory Board, Eicholtz Clinic, and Dr. C. G. Kay Sharp (Leeds), chairman of the Prevention of Blindness Committee.

In the *British Medical Journal* of March 18 (p. 567) a summary appeared of the report to the British Red Cross Society by Major-General Sir John Kennedy on his visit to the refugee camps and hospitals for Spaniards in the Pyrenees. Sir John Kennedy has now returned from a further visit and reports that of the 300,000 refugees from Spain being cared for in the French Pyrenees all remaining in France are under cover in camps in the Perpignan district. In tackling this problem of housing thousands of homeless sick and wounded men the French authorities have the further consideration that some thousands are likely to remain in France for an indefinite period. The purpose of Sir John Kennedy's visit was primarily to discover in what way the British Red Cross Society could best help the French in their tremendous task. He expresses admiration for the efficient organization of the French authorities both in the hospital accommodation and in the planning of the camps themselves. Where the British Red Cross Society has been able to give most valuable help is in satisfying the immediate clothing needs of the refugees. Facilities have been afforded by the French Government for the import of goods duty free through the Red Cross Society.

The Board of Control, with the approval of the Minister of Health, has appointed Mr. James C. Anderson, M.B., F.R.C.S., as honorary consulting surgeon in connexion with diseases occurring among the mentally defective patients at the Rampton State Institution, Retford, Nottinghamshire.

Mr. Philip H. Mitchiner, C.B.E., T.D., K.H.S., surgeon to St. Thomas's Hospital, has been appointed a Deputy Lieutenant for the County of London.

In our advertisement columns this week the University of London invites applications for the University Chair of Obstetrics and Gynaecology tenable at the London (Royal Free Hospital) School of Medicine for Women. The salary attached to the post is £2,000 per annum.

Two Sir Milsom Rees scholarships for sons of medical practitioners of £100 each to Port Regis Preparatory School, Broadstairs, have been awarded to Gerald A. Jory, son of Mr. P. J. Jory, F.R.C.S., and to Victor M. Fox, son of Dr. I. S. Fox.

At the New York World's Fair, which is to open on April 30, a staff of forty doctors and seventy nurses will minister to the medical needs of the visitors and of the 50,000 permanent employees. For the first time in any international exposition physicians and public health workers are to have their own professional club, housed on the main floor of the Medical and Public Health Building.

The tenth anniversary of the death of Professor Fernand Widal was recently commemorated at the Hôpital Cochin, Paris, when Professor Bezançon delivered a lecture on the clinical spirit.

EPIDEMIOLOGICAL NOTES

Influenza

The incidence of pneumonia (primary and influenzal) continues to fall in England and Wales, 1,063 cases being notified for the week, compared with 1,205 in the previous week, and in London 118, compared with 151. Deaths from influenza remained almost as high in the Great Towns, and were considerably higher in London—49, compared with 42. In only six towns of the 126 scheduled Great Towns were more than 3 deaths attributed to influenza during the week—namely, Birmingham 5, and 4 each in Coventry, Enfield, Leyton, Stoke-on-Trent, and Swansea. In Scotland, Eire, and Northern Ireland notifications showed an appreciable increase, especially in Ireland, but fewer deaths from influenza were registered in all three countries. In Edinburgh and Glasgow there were 3 deaths each from influenza, but none in Belfast and Dublin.

Cerebrospinal Fever in Germany

In Germany (excluding Austria and the Sudeten area) the expected seasonal increase of cerebrospinal fever has been heavier than in 1937 or 1938. For the four weeks ended March 11 notifications were 104, 149, 191, and 194, compared with 25, 37, 36, and 37 respectively in the corresponding weeks of 1938. The districts on the left bank of the Rhine were chiefly affected, notably the Treves district, where the morbidity rate from January 1 to March 14 was 8.7 per 100,000 population, the Saar Territory, where it was 7.6, the Palatinate 6.8, and the Aix-la-Chapelle district 2.7. In Northern Germany the highest morbidity rate—4.2 per 100,000—was recorded at Bremen. In Austria between February 5 and March 11 129 cases were reported, and none in the same period of the previous year.

Cholera in Asia

In British India the prevalence of cholera in February and March diminished, compared with 1938, in Madras Presidency, but increased in Bengal and Bombay Presidency. With the Central Provinces these three provinces furnish 73 per cent. of the total number of cases—373,000—reported in India for the whole of 1938. The situation was particularly unfavourable in Bengal, where cases rose from 2,428 to 3,336 in the three-weeks period February 26 to March 18. In Karikal Territory, French India, 45 cases were recorded from January 1 to February 25, compared with 45 and 89 in the corresponding periods of 1938 and 1937 respectively. In Siam 5 cases (1 death) were notified from March 23 to 25 in Smud Prakar, a coastal province situated in the south-east of Bangkok, the first to be notified in this region since January, 1938, when three cases were recorded.

No. 12

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 25, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	37	4	15		2	43	6	11	3	2		
Deaths		1	—				4	3				
Diphtheria	914	90	213	40	24	1,404	155	235	63	37	1,188	165
Deaths	26	1	8	5	—	27	8	12	1	1		
Dysentery	44	3	27		—	92	19	70		—		
Deaths				—	—			—	—	—		
Encephalitis lethargica, acute	5	—	—		—	3	—	1		—		
Deaths		2					—	1				
Enteric (typhoid and paratyphoid) fever	16	—	7	8	1	13	2	3	1	—	21	
Deaths	2	—	1	—	—	1	—	—	—	—		
Erysipelas			70	5	4			74	6	6		
Deaths		—					—	1				
Infective enteritis or diarrhoea under 2 years												
Deaths	62	13	13	6	3	47	18	6	4	2		
Measles		23	126		4			1,495		80		
Deaths	4	—	—	3	—	67	23	36	2	12		
Ophthalmia neonatorum	76	11	33		—	93	15	62		—		
Deaths												
Pneumonia, influenzal*	1,063	118	20	11	16	1,254	122	7	14	14	1,462	143
Deaths (from influenza)	174	49	8	1	—	78	9	5	—	1		
Pneumonia, primary			167	22				235	6			
Deaths		17		13	4		25		34	23		
Polio-encephalitis, acute	2	—				1	—					
Deaths		—					—					
oliomyelitis, acut e	7	2	1		—	3	—	—		1		
P Deaths		—					—	—				
Puerperal fever	5†	5	14	1	—	2†	2	17	2	—		
Deaths		—					1‡					
Puerperal pyrexia	184	21	21		1	189	16	30		5		
Deaths												
Relapsing fever	—	—			—	1	—			—		
Deaths												
Scarlet fever	1,772	152	319	60	67	2,167	200	355	70	74	2,167	239
Deaths	2	—	—	—	1	6	3	2	—	—		
Small-pox	—	—	—		—	2	—	—		—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—			—	—	—		
Whooping-cough		296	458		46			94		7		
Deaths	23	8	7	—	1	13	1	1	1	—		
Deaths (0–1 year)	403	62	63	20	17	391	76	72	36	36		
Infant mortality rate (per 1,000 live births)	62	52				65	62					
Deaths (excluding stillbirths)	5,596	1,157	625	253	142	4,994	991	660	205	163		
Annual death rate (per 1,000 persons living)	13.7	14.7	12.7	17.0	12.5	12.3	12.5	13.5	13.8	14.4		
Live births	6,190	1,032	871	380	258	6,769	1,239	927	385	278		
Annual rate per 1,000 persons living	15.2	13.1	17.6	25.5	22.7	16.7	15.6	18.9	26.0	24.6		
Stillbirths	257	38	44			283	31					
Rate per 1,000 total births (including stillborn)	40	36	48			40	24					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Sleep disturbed by Dreams

"G.P." writes: I should be glad of information as to treatment of disturbed sleep owing to constant dreams in old and younger people.

Pruritus Ani

Dr. H. WOOD-HILL writes: After trying innumerable forms of treatment for this intractable condition, I have found painting freely with a preparation of equal parts of tar, collodion, and acetone to act like a charm.

Snoring

"SUGG" writes: This objectionable procedure can take place only when the mouth is open, as only then can the mechanism of stertor be brought into action. Shut the mouth of the snorer, and, so far as the problem of snoring is concerned, "all's well." One should bear in mind the need to eliminate from the problem the question of a possible physical factor or cause. A sleeping person is not always relaxed, but when a sleeper lies upon his back, and is relaxed, the lower jaw falls. If he continues to breathe (that is, inspire *and* expire) fully through either mouth or nose, snoring does not occur. It is only when the stream of air, usually in the act of inspiration, is divided by nasal *and* oral breathing that stertor takes place. More shortly put, a sleeper lying on his back with the mouth open does not necessarily snore, though he may snort occasionally. The disagreeable noises are caused by the "flapping in the wind" of the soft palate and/or uvula. On the subjects of (*a*) prevention and (*b*) cure of snoring much could be written, but I must be brief. The old-fashioned method of our grandparents may be tried—that is, the sewing of a cotton-reel to the middle of the back of nightshirt or pyjama trousers may lead to a change of position by the snorer. A child, or indeed an adult, may be moved from the dorsal attitude, or may be persuaded to move therefrom by an appeal to the subconscious, without being wakened, but an early return to the original position is to be expected. A change from the dorsal decubitus may not be enough (though it often is) to prevent snoring, because lying on the side does not always prevent the jaw from dropping. In a case of obstinate or recurring snoring a properly made and properly fitted "lower-jaw-fracture" bandage with skull-cap attachment, as obtainable (usually for other purposes) from beauty parlours, will prevent falling of the jaw during relaxation in sleep, and so prevent snoring, whatever the position. A snorer may be aroused by his own snoring, or if merely dozing may continue to doze while hearing his own snores. Postural discipline will, then, help in prevention; but the snoring can be cured by suggestion, because a habit of snoring can be, by suggestion (the essence of which is iteration), converted into a habit of not snoring if the intelligent co-operation of the patient is obtainable.

Income Tax

Replacement of Car

"T. H." had a car which cost £480 in 1928. He sold it for £30 when the written-down value was £38, and bought a new car for £218. What can he claim?

*** (1) As an obsolescence allowance, £38 − £30 = £8; this is treated as an expense of the year when the transaction took place. (2) Depreciation for the following income tax year on £218.

LETTERS, NOTES, ETC.

Influenza in Belfast

Dr. MARGARET H. ELLIOTT (Belfast) writes: The type of influenza generally prevalent at the present time varies slightly from the usual form of epidemic. Whether this is significant remains to be seen. The disease as commonly found to-day seizes on young and old, and *la grippe* is a name which still applies. The acute attack is common in the old, the young, and those predisposed by preceding cardiac or lung complaints, and is likely to prove serious. It is ushered in by sudden angina and collapse with pallor and sweating, as in massive lobar affections of the lungs, when accompanying pyrexia, or in conditions such as anaphylaxis or asthma. The subsequent course is similar to that of acute bronchitis or lobar pneumonia. In those more young and hale the attacks are limited to malaise and ague-like pain. There is also the more usual gastric type of attack, with accompanying emesis and headache as prominent symptoms. Occasionally these attacks begin with symptoms like those of peritonitis or of an "acute abdomen." After the attack is over there is a predisposition in the individual to further attacks of infection, unless the ordinary sensible precautions are instituted.

British Health Exhibit at Copenhagen

Britain is represented in the Copenhagen Health Exhibition by the Fitter Britain Exhibit which was on display in the Empire Exhibition in Glasgow last year. The Health Exhibition was opened in the Copenhagen Forum by the Prime Minister, Dr. Stauning, on March 17, and will remain open for one month. While considerable emphasis is laid upon the anatomy and physiology of the body in other sections of the exhibition, the Fitter Britain Exhibit shows rather the organization of health services and the measures taken in this country to prevent ill-health. The exhibit, which is in the hands of the Central Council for Health Education, is arousing great interest both in medical circles and amongst the general public. One of its main features is the mechanical man, a large figure showing symbolically how some of the main human organs work, and explaining their operations by means of a synchronized talk. There is also a model of a modern health clinic such as the health authorities are now setting up in many centres in this country. The exhibit was sent to Denmark by the Central Council for Health Education in co-operation with the British Council.

Sequel to a Warning

Lieutenant-Colonel W. A. SPONG (Sutton Benger, Chippenham) writes with reference to the warning which appeared in the *Journal* of March 25 (p. 656) about the "traveller" in a type of crêpe rubber bandage: Your readers will be pleased to hear that this man has been arrested at Fareham. I would advise those who, like myself, have been "done" to communicate with their local police superintendent.

We have received from Ciba Limited, 40, Southwark Street, London, S.E.1, a booklet entitled *The Sex Hormones*, which gives a brief description of their uses and a list of the particular products made by this firm, from whom the booklet can be obtained on application.